THE STATE OF WASHINGTON

DEPARTMENT OF EDUCATION

HENRY B. DEWEY, Superintendent of Public Instruction.

BULLETIN NO. 1.

High School Extension.

Olympia, Wash., March 17, 1911.

Purpose of This Bulletin.—This bulletin is issued for the purpose of outlining the course of study prepared by the State Board of Education for those persons desiring to undertake the completion of a high school course otherwise than by attendance at a secondary school. The bulletin outlines in some detail the following points:

I. The provisions of the Code of Public Instruction.

II. Rules governing the high school extension examinations.

III. Outline course of study.

IV. General questions to be answered by applicant.

V. Syllabus of subjects covered as adopted by the State Board of Education.

VI. Special Syllabi in physics, physical geography, history and civics.

HIGH SCHOOL EXTENSION.

I.—Introduction.

The Code of Public Instruction (Chapter 18, Sections 1-3) makes provision for the establishment of a system of high school extension, to be administered by the State Board of Education. The provisions of the law are as follows:

Section 1. The State Board of Education shall outline a course of reading and study similar to a course of study required in a full four-year high school course, and shall provide for the examinations and certification of those taking or completing such course. Examinations for this purpose shall be held at the time and place of holding examinations for teachers' certificates, and in such form as to fully test the students' knowledge of the subject or subjects examined in.

Section 2. The questions for such examinations shall be prepared by the State Board of Education, and shall be furnished to the State Superintendent of Public Instruction, who shall cause the same to be printed and distributed to the several county superintendents upon request therefor, the same as the questions for teachers' examinations are printed and distributed. The manuscripts containing the answers of applicants shall be returned to the Superintendent of Public Instruction, to be marked and graded by him, and who shall issue certificates to those who have the required percentage in the various branches, which shall be fixed by the State Board of Education.

Section 3. Upon the completion of the full course as outlined by the State Board of Education, a state high school certificate shall be issued to the applicant by the said board and such certificate shall entitle the holder thereof to enter the freshman class of the State University or to enter any other class in the other state educational institutions as may be specified by the State Board of Education.

II.—Rules Governing the High School Extension Examinations.

1. Persons twenty-one years of age may, with the approval of the county superintendent, take the examination on subjects on which they think themselves prepared.

2. Persons under twenty-one years of age shall not be considered eligible to take the examinations on subjects provided for in the high school of their district.

3. Pupils from a non-accredited high school may take the examination on work done successfully in the high school. In such cases

the subjects should conform with the outline of one of the regular high school courses.

4. No person shall be admitted to any such examination unless he shall have given to the county superintendent notice of his intention to take such examination and the subjects in which he desires to be examined at least thirty days before the examination and obtain permission from such superintendent to take such examination.

5. Examinations will not be given on work below the ninth grade, neither on the work in a subject of any school year to a person not having credit for the preceding year's work in that subject, unless the person is taking the examination on the preceding work in the subject at the same time. Persons to be eligible to take the examination must have likewise an eighth grade certificate or equivalent credentials.

6. The holder of a certificate of completion of the high school extension course shall be entitled to the same privileges as the holder of a diploma issued by a four-year high school.

7. The diploma for the completion of the high school extension shall be granted on a basis of 1280 credits, no subject being accepted in which a lower grade than 70 per cent. has been obtained.

III.—OUTLINE COURSE OF STUDY.

Ninth Grade.

Required Subjects.	Elective Subjects.
English.	Latin.
Algebra.	Physical Geography.
	Ancient History.

Tenth Grade.

	Latin.
English.	Modern History.
Plane Geometry.	Bookkeeping.
	Botany.

Eleventh Grade.

	Latin.
English.	English History.
Algebra (half year).	Physiology (half year).
	Geometry (half year).
	German.

Twelfth Grade.

English.	Commercial Law (half year).
Physics.	Economics (half year).
U. S. History and Civics.	Latin.
	German.

IV.—GENERAL QUESTIONS.

Applicants will be required to hand in written answers to the following questions:

1. Give your name and age.
2. Give your postoffice address.
3. Give name and occupation of parent or guardian.
4. Have you completed the work of the eighth grade and passed the examination of that grade? When?
5. What was the school last attended by you and in what grade were you enrolled?
6. Why are you not attending your high school?
7. How many years have you attended a high school and how many high school credits have you received? (A credit represents the completed work in any one five-hour subject for one half year.)
8. What courses do you now propose to be examined in?
9. When and how did you prepare for this examination?
10. For what purpose do you take this examination?
11. How far is your home from the nearest high school?

V.—SYLLABUS OF SUBJECTS COVERED.

The following is the syllabus and outline of the course as adopted by the State Board:

ENGLISH.

First Year. **First Semester.**

1. Rhetoric and Elementary Composition with special reference to narrative writing. Emphasis should be given to punctuation, the choice of words, and the structure of sentences and paragraphs. No pupil who is totally deficient in grammar, spelling, punctuation, or in general appearance of written work will be considered to have completed the semester's work. The pupil should thoroughly master as much as is contained in the first one hundred and twenty-eight pages of Scott and Denny's Elementary English Composition, or the equivalent in a standard text book.

2. The careful study of the following masterpieces: Irving's Rip Van Winkle and the Legend of Sleepy Hollow; Hawthorne's Great Stone Face and the Ambitious Guest; Bryant's Ulysses Among the Phaeacians.

3. The reading of two of the following:
   Stevensons' Treasure Island.
   Cooper's The Last of the Mohicans.
   Hale's The Man Without a Country.

First Year. **Second Semester.**

1. The elementary study of argument and the figure of speech with practice in descriptive writing. Scott and Denny, pages 129-241, or an equivalent.

2. The careful study of Scott's Lady of the Lake; Tennyson's Idylls of the King.

3. The reading of two of the following:
   Scott's Ivanhoe.
   Hughes' Tom Brown's School Days.
   Franklin's Autobiography.

Second Year. **First Semester.**

1. Continued practice in narrative and descriptive writing. A study of letter writing and business forms. Scott and Denny's Composition-Literature, chapters I-IV or equivalent subject matter from a standard text.

2. The careful study of at least six selections from Irving's Sketch Book and Shakespeare's Merchant of Venice.

3. The reading of two of the following:
   Macaulay's Lays of Ancient Rome.
   Hawthorne's The House of Seven Gables.
   Dickens' David Copperfield.

Second Year. **Second Semester.**

1. The study of verse forms, figures of speech, and forms of prose discourse. Scott and Denny's Composition-Literature, chapters V.-VII, or an equivalent.

2. The careful study of Goldsmith's The Deserted Village, Coleridge's Rime of the Ancient Mariner, Shakespeare's Julius Caesar.

3. A review of the principles of English grammar. Any standard text.

Third Year. **First Semester.**

1. The pupil should continue practice in composition by the writing of longer descriptive or narrative themes. The elementary study of exposition. Scott and Denny's Composition-Literature, chapters VIII-IX.

2. The careful study of the following:
   Lamb's Essays of Elia.
   George Eliot's Silas Marner.
   Addison and Steele's Sir Roger de Coverly Papers.

3. The reading of two of the following:
   Scott's Kenilworth.
   Dickens' A Tale of Two Cities.
   Thackeray's Henry Esmond.

Third Year. Second Semester.

1. The pupil should continue practice in composition through expositions of 100–1200 words, carefully developed through preliminary outlines. Scott and Denny's Composition-Literature, chapter X.

2. The careful study of Shakespeare's Macbeth, Macaulay's Life of Johnson, Browning's Selected Poems.

3. The reading of two of the following:
   Irving's Oliver Goldsmith.
   Thoreau's Walden.
   Porter's Scottish Chiefs.

Fourth Year. First Semester.

1. Advanced work in Argumentation. The preparation of preliminary briefs for debates. Scott and Denny's Composition-Literature, chapter X.

2. The careful study of Milton's Minor Poems, Burke's Speech on Conciliation, Carlyle's Essay on Burns with Burn's Representative Poems.

3. The reading of two of the following:
   Shakespeare's Hamlet.
   Jane Austin's Pride and Prejudice.
   Washington's Farewell Address.
   Webster's First Bunker Hill Oration.

Fourth Year. Second Semester.

1. A critical study of the history of English Literature together with the study of Chaucer's Prologue to the Canterbury Tales, one of Marlowe's plays, at least three of Bacon's Essays, and a selection from Spenser's The Faerie Queene. Any standard history of English Literature, such as Halleck, Painter, Long, etc.

2. The student should be able to write a meritorious production of at least 1,000 words upon an assigned subject. Freedom is given the student in the choice of literary form.

LATIN.

First Year. First Semester.

The pupil should gain a thorough knowledge of forms, the simple principles of syntax, and the ability to write easy sentences in Latin. As much as is contained in pages 1-109 of Collar and Daniell's First Year Latin, or an equivalent from any standard text.

First Year. Second Semester.

The work of the first semester continued and the text finished. The pupil should be able to translate easy Latin at sight.

Second Year. First Semester.

Caesar's Gallic War, Book 1, and the first ten chapters of Book II, with the use of a grammar and a text in prose composition.

Second Year. **Second Semester.**

Caesar's Gallic War, Book II, completed and Books III and IV. Grammar and prose composition. In the reading of Caesar, attention should be given to the correlation of the history and geography of his period.

Third Year. **First Semester.**

Four of Cicero's Orations against Catiline, grammar, prose composition and practice in sight reading from such a text as Gleason's A Term of Ovid.

Third Year. **Second Semester.**

Cicero's Manilian Law and Poet Archias. Prose composition and sight reading as in the preceding term.

Fourth Year. **First Semester.**

The study of the first three books of Virgil's Aeneid, drill on the principles of Latin hexameter, a study of the leading geographical, historical and mythological allusions in the text, sight reading from Ovid and a review of grammar.

Fourth Year. **Second Semester.**

Virgil's Aeneid, Books IV, V, VI; Sight reading and review of grammar as in the preceding term.

HISTORY.

First Year. **First Semester.**

A survey of the oriental nations and a study of Greece to the death of Alexander. Pupils should draw outline maps and should keep systematized note books based upon the chief topics of the text, collateral readings, etc.

First Year. **Second Semester.**

Rome to the death of Charlemagne (814). Outline maps and collateral readings from references cited in the text. Any modern text book based upon the recommendations of the Committee of Seven of the American Historical Association.

Second Year. **First Semester.**

The important elements of Mediaeval History from the death of Charlemagne (814), through the Revival of Learning (1500). Outlines, maps and supplementary reading as in Ancient History.

Second Year. **Second Semester.**

Modern European History. The era of the Protestant reformation and the rise of national states should be studied intensively.

Third Year. **First Semester.**

English History from the earliest times to the reign of James I. Any standard text, such as Larned, Robinson, West, Wrong, Coman and Kendall, etc.

Third Year. **Second Semester.**

This semester should be chiefly concerned with the development of the English constitution, the growth of the industrial classes, and the influence of English thought and progress throughout the world.

Fourth Year. **First Semester.**

Advanced United States History. A study of our nation with reference to its constitutional, political, and industrial development. Channing's Students' History of the United States, pages 1-316, or a similar text.

Fourth Year. **Second Semester.**

As much as is contained in Channing, pages 317-606. Attention should be devoted to the origin and present character of our political institutions—local, state and national. In connection with the text employed, the student should read Hinsdale's The American Government, or James' and Sanford's State and Nation or a similar text book on civil government.

MATHEMATICS.

Algebra.

First Year. **First Semester.**

The work of the first semester should include the fundamental processes, factoring, common multiples and divisors, fractions, and simple equations. Wentworth, Wells, Stone-Millis, or any modern text book.

First Year. **Second Semester.**

Simultaneous equations, involution and evolution, theory of exponents, radicals, and quadratic equations.

Geometry.

Second Year. **First Semester.**

Plane Geometry, Books I and II. The pupil should be able to demonstrate original exercises of ordinary difficulty based on the above.

Second Year. **Second Semester.**

Plane Geometry completed. The solution of problems and the demonstration of original exercises.

Third Year. **First Semester.**

A continuation of Algebra. Review of quadratic equations, ratio and proportion, progressions, variation, logarithms, permutations and combinations, variables and limits, series, binomial theorem, with the completion and review of the text employed.

Third Year. **Second Semester.**

Solid Geometry. The properties of straight lines and planes; dihedral and polyhedral angles; of projections, of polyhedrons, including prisms, pyramids and frustrums; of cylinders, cones and spheres; of

spherical triangles and measurements; of surfaces and solids; conic sections, including the parabola, eclipse and hyperbola. Any modern text book.

SCIENCE.

First Year. **First Semester.**

Physiography. The course should include a study of the earth as a planet; its general features, the change in its crust; rivers and river valleys; plains, plateaus and deserts; mountains, volcanoes; earthquakes; geysers; lakes and swamps; glaciers and the glacial period. The pupil should also familiarize himself with (1) the use of the United States Geological Survey, topographic maps, and (2) the common rock-forming minerals and the most common varieties of each of the three great groups of rock. Tarr's, Davis' or Gilbert and Brigham's text.

First Year. **Second Semester.**

Physiography continued. A study of the ocean, shore lines; the atmosphere; winds and storms, weather and climate, physiography of the United States, and of the State of Washington; rivers of the United States; the distribution of plants and animals; man and nature. The pupil should familiarize himself with the determination of meteorological conditions from daily weather reports and forecasting.

Second Year. **First Semester.**

Botany. The pupil should know the plant as a complete organism, living its life in a natural way. He should be familiar with the conditions favorable and unfavorable to the life of the plant, should be taught to observe and to recognize the common forms around him.

The following outline may be suggestive:

The Leaf—Anatomy, photosynthesis, respiration, transpiration, assimilation.

The Shoot—Anatomy of a typical shoot, including relationship of position of leaf, stem, the arrangement of leaves and buds on the stem and deviations from symmetry.

The Bud—Mode of origin of new leaf and stem.

The Seed—Dicotyledons without and with the endosperm, a monocotyledon and a gymnosperm, structure and homologous parts.

Food Supply—Experimental determination of its nature and value. Phenomena of germination and growth of the embryo.

The Root—Structure of a typical root; position and origin of secondary roots; hair zone, cap and growing point.

The Flower—Structure and function of parts, especially of ovule and pollen.

The Fruit—Structure of typical fruit, especially with reference to the changes from the flower and the ovule to seed.

Second Year. **Second Semester.**

Botany continued

Algae—Pleurococcus, spirogyra, vaucheria, fucus, nemalion. In connection with the above, a study of the cell, sytoplasm, nucleus, sap-cavity and wall is made.

Fungi—Bacteria, rhizopus, yeast, puccinia, mildew, mushroom.

Lichens—Physicia.

Bryophytes—Marchantia, polytrichum.

Pteridophytes—(1) Aspidium with the prothallium; (2) equisetinease, equisetum; (3) lycopodineae, selaginolla.

Gymnosperms—Pinus.

Angiosperms—Both monocotyledons and dicotyledons.

Classification of about fifty of the spring flowers.

Third Year. **First Semester.**

Physics. The study of mechanics and sound as treated in the more recent text books. The text should be re-enforced by the performance of twenty to twenty-five experiments, such as the following, from Chute's Physical Laboratory Manual: Nos. 19, 21, 23, 25-28, 31-33, 35-37, 39, 40, 42-48, 55-58, 60, 62, 63.

Third Year. **Second Semester.**

Physics continued. Light, Heat, Magnetism and Electricity. Such experiments as are suggested in Chute's Manual—68-70, 75-77, 79, 85, 86, 89, 97, 107, 109, 110, 116, 119, 121, 122, 125, 127.

GERMAN.

First Year. **First Semester.**

Drill in the fundamental rules of grammar, in pronunciation, and in the use of a limited vocabulary in simply constructed sentences. Spanhoofd's Lehrbuch der Deutschen Sprache, lessons 1-20, Muller and Wenckebach's Gluck Auf, pages 1-33, or equivalent subject matter from similar texts.

First Year. **Second Semester.**

The work of the first semester continued. Spanhoofd's Lehrbuch der Deutschen Sprache, lesson 21 et seq., Muller and Wenckebach's Gluck Auf, page 34 et seq.

Second Year. **First Semester.**

The student should acquire a more thorough knowledge of grammar, a larger vocabulary, with greater ease in using it, and an acquaintance with literary productions well adapted to the advancement of the pupil. Bernhardt's German Composition, lessons 1-16, or an equivalent. Two of the following classics: Anderson's Bilderbuch ohne Bilder, Storm's Immensee, Heyse's L' Arrabiata, Baumbach's Tales, Gerstacker's Germalshausen, Heyse's Die Blinden, Goethe's Des Marchen.

Second Year. Second Semester.

Bernhardt's German Composition, lesson 17 et seq. Three of the following classics: Wilhelmi's Einer muss Heiraten, Benedix's Der Prozess or Der Weiberfeind, Moser's Der Bibliothekar, Schiller's Neffe als Onkel, Hillern's Hoher als de Kirche, Heyse's Das Madchen von Treppi, Anfgang und Ende.

BOOKKEEPING.

Drill in explanation and application of the principles of modern accounting, involving use of ledger, journal, cash book, sales book, and the common forms of commercial paper, as checks, drafts, notes, etc. Neatness and accuracy throughout are insisted upon as a vital element of the work. Rapid calculation and penmanship are regarded as part of the work. The course presupposes the completion of William and Rogers' Modern Illustrative Bookkeeping or its equivalent.

ECONOMICS.

This is based on Bullock's Elements of Economics as a text book. It includes:

(a) A study of the nature of wealth.

(b) A survey of the general process of production, and land, labor and capital as productive agents.

(c) A study of the nature of value, and money as the common denominator thereof.

(d) An investigation of the problem of distribution as related to the theories of rent and wages.

(e) A survey of the present social and industrial problems, especially the trust question, the tariff question, the labor problem and socialism.

(f) A study of our monetary history and present monetary and financial methods.

COMMERCIAL LAW.

The purpose of this study is to teach the fundamentals of business law, legal rights and obligations in business. It is in no sense a training in law, but a simple presentation of the subjects of contracts, property, negotiable paper, agency, partnership, and insurance, etc., a knowledge of which is important in any line of business. The student should familiarize himself with the subject matter of Burdick's Commercial Law or Huffcutt's Essentials of Commercial Law.

VI.

In addition to the foregoing, the State Department of Education has prepared the following outlines of the courses in Physics, Physical Geography, and United States History and Civics, in order to make the syllabus covering these branches more explicit:

PHYSICS, 12th grade, 1 credit.

Use any standard text book. The following subjects must be covered:

1. The various states and properties of matter; definitions of mass, weight, density, and volume.
2. The metric system and its application.
3. The statics of solids, including:
   - (a) General conditions of equilibrium and simple equilibrium.
   - (b) Equilibrium of three parallel forces, and of any number of parallel forces.
   - (c) The moment of a force.
   - (d) General law of gravitation.
   - (e) The center of gravity.
   - (f) Stable, unstable, and neutral equilibrium.
   - (g) The equilibrium of three concurrent forces.
4. Hydrostatics, including:
   - (a) Pascal's law, with practical applications.
   - (b) Gravity pressure.
   - (c) The laws and principles of buoyancy.
   - (d) Specific gravity, both of solids and liquids.
5. Pneumatics, including:
   - (a) Forces to which gas pressure is due.
   - (b) Atmospheric pressure.
   - (c) Molecular motion.
   - (d) Practical applications.
6. Kinetics, including:
   - (a) The definition of force, motion, velocity, momentum, work, energy, power, etc.
   - (b) Uniform and variable motion, with formulas.
   - (c) The law of falling bodies, with formula.
   - (d) Newton's laws of motion.
   - (e) The conservation of energy.
   - (f) Machines, mechanical advantage, the laws of machines.
   - (g) The lever, wheel and axle.
   - (h) Fixed and movable pulleys.
   - (i) Inclined plane.
   - (j) Curvilinear motion; centripetal and centrifugal force.
   - (k) The laws of the simple pendulum.
7. Heat, including:
   - (a) Definition, in terms of kinetic theory.
   - (b) Definition of temperature, in terms of the law of exchange.
   - (c) Measurement of temperature.
   - (d) Sources of heat.
   - (e) Transmission, diffusion and effects of heat.
   - (f) The determination and definition of the heat of fusion.
   - (g) Heat and work.

8. Sound, including:
   (a) The origin of sound.
   (b) The propagation of sound waves.
   (c) The reflection of sound.
   (d) Resonance.
   (e) Beats, the interference of sound.
   (f) Harmony and discord.
   (g) Transverse vibration of rods or bars free at one end.
   (h) The vibration of strings.
   (i) The pitch of open and closed pipes.
9. Light, including:
   (a) The principles of radiant energy.
   (b) Rectilinear propagation of light in a homogeneous medium.
   (c) Photometry.
   (d) Reflection.
   (e) Refraction.
10. Magnetism and electricity, including:
   (a) Magnets and magnetic substances.
   (b) Different classes of magnets.
   (c) The laws of magnetic force; polarity.
   (d) Magnetic induction; the molecular theory of magnetism.
   (e) The definition of magnetic fields and lines of magnetic force.
   (f) Terrestrial magnetism.
11. Static electricity, including:
   (a) Electrification by friction.
   (b) The law of attraction and repulsion.
   (c) Conductors and insulators.
   (d) Difference of electric potential of two points.
12. Current electricity, including:
   (a) Action in simple cell.
   (b) Daniell cell.
   (c) The magnetic heating, and chemical effects of current.
   (d) Electrical quantities and units.
   (e) Ohm's law.
   (f) Measuring instruments: the principles involved.
   (g) The grouping of cells.
   (h) The determination of integral resistance of a cell by formula.
   (i) Laws of resistance of wires.
   (j) Joint resistance and current division in a divided circuit.
   (k) Fall of potential in a circuit.
   (l) Wheatstone's bridge.
   (m) Induced E. M. F.
   (n) Simple dynamo two-pole field, single rotating loop, alternating and direct.
   (o) Simple electric motor, two-pole armature.

13. Practical applications of electricity.

14. Throughout the course numerous problems will be required. All the problems in any standard text book on physics should be solved. It must be borne in mind that a simple text book course, without any laboratory experiments, should be exceedingly thorough to be even the approximate equivalent in value of a course in which all the principles are established experimentally.

PHYSICAL GEOGRAPHY, 9th grade, 1 credit.

Outline of subjects to be covered:

1. The Earth as a planet, including:
   - (a) The size, shape and movements of the earth.
   - (b) Its relation to other members of our solar system.
   - (c) Methods of determining geographical location; latitude and longitude.
   - (d) The scientific determination of time.
   - (e) Magnetism.
   - (f) Maps and map projection.

2. The atmospheric envelope of the earth, including:
   - (a) Physical properties of the air.
   - (b) Air pressure and density.
   - (c) Temperature.
   - (d) Movements of the air.
   - (e) Atmospheric moisture.
   - (f) Climatic and weather conditions.
   - (g) Atmospheric phenomena of light and electricity.

3. Water on the earth; the ocean and all bodies of fresh water, including:
   - (a) Distribution, area, uses and characteristics of the ocean.
   - (b) Saltness, temperature and depth of the ocean.
   - (c) Movements of the waters of the ocean.
   - (d) The floor of the ocean.
   - (e) Animal and vegetable life in the ocean.
   - (f) Sources and disposal of fresh water.
   - (g) Glaciers.
   - (h) Subterranean movements of water.

4. The land surface of the planet, including:
   - (a) Nature, origin and classification of rock.
   - (b) The common minerals.
   - (c) The soil.
   - (d) Altitudes; forms of relief.
   - (e) Deserts.
   - (f) Shore lines.

5. The distribution and adaptation of plants, lower animals, and man; the geographic background of human history.

UNITED STATES HISTORY AND CIVICS, 12th grade, 1 credit.

In the study of United States History the following topics will be covered:

1. The period of discovery, colonization and struggle, 1492-1789, including:
   - (a) The topography of the country.
   - (b) The original inhabitants.
   - (c) Conflicting forces in the colonies.
   - (d) Remote and direct causes, and the results, of the Revolutionary War.
   - (e) The Articles of Confederation.
   - (f) The making of the Constitution.
2. The growth of the nation, 1789-1865, including:
   - (a) The establishment of nationality.
   - (b) Second war with Great Britain.
   - (c) The public domain and the westward movement.
   - (d) Rise of economic, social and political forces that caused the Civil War.
   - (f) The Civil War and its immediate effects.
3. The period of reconstruction and economic development, 1865 to the present, including:
   - (a) Problems and plans of reconstruction.
   - (b) The rise and growth of modern, social, political and economic institutions.

CIVICS. The subjects to be covered:

1. Local government, including:
   - (a) Village, town and city municipal government.
   - (b) School district organization and administration.
   - (c) County government.
2. The government of the State, including:
   - (a) The Constitution of the State of Washington.
   - (b) Instruments of state government.
3. The federal government, including:
   - (a) Organization; constitution.
   - (b) Relations of the federal government with the people.
   - (c) Powers of the federal government.
   - (d) Comparison with the governments of other countries.

NOTE.—A High School Manual for the high schools of the state is now in process of publication by the state department. It will be ready for distribution not later than July 1, 1911. Prospective applicants for high school diplomas will do well to procure copies of this manual, as it contains much additional information regarding the high school course of study. It will be forwarded on receipt of twenty cents in stamps. (Do not send money.)

STATE OF WASHINGTON

DEPARTMENT OF EDUCATION

HENRY B. DEWEY
Superintendent of Public Instruction

Bulletin No. 2 Olympia, Wash. May 1, 1911

HIGH SCHOOL MANUAL

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STATE OF WASHINGTON

DEPARTMENT OF EDUCATION

Bulletin No. 2. OLYMPIA, WASH. May 1, 1911

HIGH SCHOOL MANUAL.

INTRODUCTION.

With the adoption of an outline course of study for the high schools of the State of Washington, February 21, 1910, the State Board of Education recommended that a Manual for the course be prepared and published by the Department of Public Instruction.

The preparation of the Manual has been under the supervision of Mr. F. F. Nalder, Deputy State Superintendent of Public Instruction. In this work, Mr. Nalder has had the counsel of a large number of high school teachers throughout Washington as well as of those connected with the higher institutions of learning. The diversity of ideals that obtain in a state such as ours, where conditions of climate and industry are so varied, find immediate reflection in the methods of instruction in the secondary schools, thus lending unusual difficulties to the task—difficulties which Mr. Nalder has overcome with the success that deservedly follows perseverance and a fine sense of devotion to duty.

The purpose of the work is two-fold: First, to outline a minimum expectation as to the scope of each subject described

and to suggest methods for the teaching of the work; second, to afford information concerning the essential requirements that should govern teachers and school officers in the organization of libraries, laboratories, manual training shops, etc.

The Manual is intended, of course, to be suggestive rather than mandatory.

Henry M. Hart,
Chairman High School Committee,
State Board of Education.

HIGH SCHOOL MANUAL.

ENGLISH.

General Suggestions—

This subject is rightly regarded as by far the most important subject in the entire high school program. The study of our own tongue yields abundant and valuable information, and develops literary power. Through its appeal to every faculty the study of English stimulates the highest emotional nature by means of the graphic presentation of worthy ideals, and in some way or other appeals to the nature of every individual at all times.

The great object in the high school course in English is twofold—to develop facility and conciseness in all oral and written expression, and to inculcate good and discriminating habits in reading. In order to assist in attaining these ends the following suggestions are offered:

Kinds of Subjects for Themes.

1. To the greatest possible extent the subjects of all themes and compositions should be those about which the pupil has some knowledge, or about which he can readily acquire some information, and in which he is really interested. No one, least of all a young person, can write intelligently unless he really knows what he is writing about and has interest in the subject. Make use of subjects about which the student is studying in other classes. Emphasize the necessity of having the pupils first write what is in their own minds on any subject.

The Use of Good English Generally.

2. Insistence should be made on the general use of correct English, particularly in written tests in all subjects taught in the school. There is no more deplorable tendency than that of

allowing students to submit, in doing the work of other subjects, written work couched in miserable English. On the other hand, there is no more practical means of correlating the entire high school course than that of insisting on correct English, accurate spelling and punctuation, and neatness in all written work. No matter what the subject may be, any teacher who accepts a badly written report or paper on any scientific, historical or other subject and gives credit therefor without insisting on the correction of the English is branding himself as incompetent and doing his pupils irreparable injury.

The Necessity for Constructive Criticism.

3. The high school pupil has had comparatively so little practice in expressing his thoughts in writing that he is easily discouraged. He reads and speaks thousands of words for one that he commits to paper, hence the ever present necessity for stimulation and encouragement on the part of the teacher of English composition. Particularly should the instructor point out features wherein written compositions may be improved in the larger aspects of structure and the arrangement of material. The errors of a theme should be indicated and the pupil required to study out just wherein the errors lie and then make his own corrections. These corrections should be made over and over if necessary until the theme is really well written. No correction should be let go by until it is fully understood by the pupil. Theme criticisms, whether in class or in private conference, should be always made constructive in the highest possible degree, and should aim constantly at a more adequate expression of the pupil's ideas.

Theme-writing in Class.

4. Particularly in the first and second years of the high school course, short themes should frequently be written in class. For such work familiar subjects may be brought up unexpectedly, or less familiar ones may be assigned some days ahead. The teacher's time and effort may be economized in this phase of the work by having pupils exchange and correct each others'

papers. This statement must not be taken as intending to minimize the necessity for detailed criticism by the teacher. The teacher must actually criticise in detail themes presented by pupils and follow the matter up throughout the course.

Drill in Reading Aloud.

5. Some time should constantly be devoted to reading aloud. One of the main objects of high school education should be to produce fluent, ready, intelligent readers. Pupils should be frequently required to stand up and read paragraphs or stanzas from the selection in hand. Only thus may the worth of many literary selections be emphasized. What is far more important to the pupil, in this way he will acquire facility and readiness in reading, and the ability to comprehend fully the thought of the author.

Training in Public Speaking.

6. Of equal practical importance with the ability to read well is the faculty of standing on one's feet and speaking clearly and to a definite point. While a formal course in this subject is outlined elsewhere in this manual, the ability to speak originally before any body cannot well be acquired in a single semester, or even in a year. It should be developed through persistent effort on the part of the teacher, by requiring pupils to do a certain amount of work along this line throughout the course. The best method of attaining this end is to devote one period per week to the subject throughout each year, requiring pupils to come to class prepared to speak for a few minutes on some definite subject, and especially to establish some definite point. Have them face the class, and speak either from memory, from notes, or, especially during the early stages of the course, to read manuscript.

Another method is to have, as an average, at least one pupil make a report on some assigned topic related to the work in hand, at every class exercise. He should be required to stand either in his place or before the class, and particularly to make his point clear. This method has features which commend it,

but will only attain its best end through a particularly skillful, persistent teacher.

Debating.

7. With reference to instruction in argumentation and debate the value of the work is determined by the degree to which pupils are trained to efficiency in clear, logical, fair-minded thinking and the convincing expression of thought. Particularly should the following points be impressed upon the minds of pupils:

(a) That the object of argument should be to instruct and convince, and not to make rhetorical display.

(b) That the most eloquent features of all argument are pertinent facts firmly established.

(c) That the approval of hearers can be best won by an attitude of courtesy and toleration.

(d) That the object of argument is to get at the truth, to generate light rather than heat.

(e) That resourcefulness in rebuttal, the best test of efficient debating, can only be acquired by a wide and thorough knowledge of the subject.

(f) That honesty is the only tolerable policy; that to put forth as your own, in spoken or written work, another's matter is absolute fraud.

Vitalizing Literature.

8. In the study of literature particular emphasis should be laid on the matter of reproducing the spirit and purpose of the author. Every great literary effort has had behind it a great human purpose. Its interest lies in this human phase. "The letter killeth, but the spirit giveth life." The teacher should particularly familiarize himself, and then instruct the pupils in regard to the circumstances and the probable motives that have produced the selection being studied. Merely to analyze a piece of literary work for the purpose of seeking out curious and obsolete constructions or to emphasize the mechanics of literature has a deadening effect on the minds of

young pupils, and tends to make them hate those noble monuments of literature which the course is designed to bring them to love.

The Division of the Work.

9. Bearing the foregoing points in mind, the entire time of a four-year course in high school English should be divided in the best possible proportion between the study of literature, the writing of English composition, and oral work. Each class should study literature, in some aspect or other, each semester and should devote part of the time to some form of original written composition and spoken discourse.

First Year English. First Semester—

RECOMMENDED MINIMUM COURSE.

1. Composition and Rhetoric. The aim in the first year should be to secure facility and spontaneity of expression. One short weekly theme should be written. All the theme writing of the first year should be in narration and description. At least half of this work should be done in class. Criticism must be largely confined to matters of spelling, punctuation and grammar, but its aim should be essentially to build up and encourage. Lay emphasis on sentence structure; this should be stressed in teaching till the pupil comes to *feel* it as the unit of progressive movement in written and spoken discourse. Any one of a number of good texts may be used as a guide and basis.

2. Literature. One selection from each of the following groups should be carefully studied in class:

Group I. Scott. Ivanhoe, Quentin Durward.
Stevenson. Treasure Island.
Irving. Sketch Book, any eight selections.

Group II. Bunyan. Pilgrim's Progress.
Dana. Two Years Before the Mast.
Kipling. Captains Courageous.

Group III. Poe, Whittier and Longfellow. The Raven, Snow Bound, and the Courtship of Miles Standish.

Coleridge and Lowell. The Ancient Mariner and The Vision of Sir Launfal.

Arnold and Macaulay. Sohrab and Rustum and The Lays of Ancient Rome.

One of the following, required for home reading, to be reported on by the pupil: Franklin's Autobiography, Bryant's Sella and Little People of the Snow, Hawthorne's Wonder-Book, or Twice Told Tales, Burroughs' Sharp Eyes and Birds and Bees, Gray's Elegy, Cooper's Last of the Mohicans, Warner's Hunting of the Deer. Ballads, fables and narrative poems. Short Stories from R. H. Davis, Kipling, Seton Thompson, Joel Chandler Harris, Frank Stockton, and Robert Louis Stevenson.

SUPPLEMENTARY COURSE.

The field is so wide that the lines of supplementary work need only be suggested. The following are suggested:

1. Drill in reading aloud, and in reciting memorized selections before the class, following the suggestions given in paragraph 6 at the beginning of the course.
2. Additional paragraph themes written in class.
3. Thorough additional drill in letter writing.
4. Systematic study of one of the works suggested above for home reading, preferably one with much lively, human interest.
5. Written reproduction of selections that have been studied in class, in the words of the pupil.

First Year. Second Semester—

RECOMMENDED MINIMUM COURSE.

1. Composition and Rhetoric. Continue the study of sentence structure. Elementary study of the simple paragraph, based on the text used, with much practice. Weekly theme. Careful study of the topic sentence. Practice letter writing, especially in writing letters concerning every-day business and social concerns. Grammatical analysis; changing from direct to indirect discourse, and *vice versa;* definition and use of phrases and clauses; homonyms and synonyms.

2. Literature. Study in class one selection from each of the following groups:

Group I. Lincoln. Gettysburg Speech.
Dickens. Christmas Carol.
Longfellow. Evangeline, or Part I of Tales of a Wayside Inn.
Shakespeare. Julius Caesar.
Tennyson. Enoch Arden.
Scott. The Lady of the Lake.

Group II. Guerber. Myths of Greece and Rome.
Homer's Iliad, at least eight books of Bryant's translation, in which Books I and VI shall be included.
Plutarch. Lives of Illustrious Men.
Bulfinch. The Age of Chivalry.

Group III. Irving. Tales of a Traveler.
Hale. The Man Without a Country.
Poe. The Gold Bug.

One of the following to be read outside of class, and reported on by the pupil:

Warner's Being a Boy, Browning's An Incident of the French Camp, How They Brought the Good News from Ghent to Aix (get the geographical and historical setting) Herve Riel, Pheidippides, Hughes' Tom Brown's School Days, Lowell's Fable for Critics, Churchill's The Crisis.

SUPPLEMENTARY COURSE.

Follow the same lines as indicated for the first semester.

Second Year English. First Semester—

RECOMMENDED MINIMUM COURSE.

1. Composition and Rhetoric. The aim should be to secure clearness of thought in exposition and argument. Review paragraphing, and develop the idea of transition from one paragraph to another. One short written theme of at least three

paragraphs completed every two weeks must be regarded as an absolute minimum. Give further attention to paragraph structure with regard to unity, coherence, emphasis. Develop the value of connectives. A good text-book must be used in connection.

2. Literature. One selection from each of the following groups should be studied:

Group I. George Eliot. Silas Marner.
Stevenson. An Inland Voyage, Travels with a Donkey.
Addison. De Coverley Papers.

Group II. Shakespeare. The Merchant of Venice, Twelfth Night.
Macaulay. Essay on Addison.

Group III. Tennyson. Idylls of the King.
Bryant. Thanatopsis, Song of Marion's Men, The Flood of Years, To a Fringed Gentian.
Aldrich. Alec Yeaton's Son, Piscataqua River, Our New Neighbors at Poukapog.
Whittier. The Tent on the Beach.

In addition, one or two of the following may be read outside of class, and reported on by the pupil: Addison's De Coverley Papers, Burns' Cotter's Saturday Night, To a Mouse, To a Mountain Daisy, Highland Mary, My Heart's in the Highlands, Bruce to His Men at Bannockburn, and Bonnie Doon, Macaulay's Essay on Addison, Scott's Marmion, Irving's Alhambra, Gaskell's Cranford, Selections from Homer's Odyssey, Warner's Essay, Scott's The Talisman and Kenilworth, Kingsley's Westward Ho! and Hawthorne's House of Seven Gables.

SUPPLEMENTARY COURSE.

1. Thorough study of an additional masterpiece of literature, selected from those suggested.

2. Drill in memorizing and reading aloud, as suggested in paragraphs 5 and 6 at the beginning of the course.

3. Drill in writing business letters, letters of application for positions, etc., with particular emphasis on penmanship, neatness, punctuation, and clear and accurate statements.

Second Year English. Second Semester—

RECOMMENDED MINIMUM COURSE.

1. Composition and Rhetoric. Drill on sentence analysis, emphasizing use of infinitives, participles, verbal nouns, and auxiliaries in verb phrases. Study of various kinds of sentences—long, short, periodic, loose, balanced, etc. Then develop the study of the composition as a whole—introduction, body, and conclusion. Some good work on composition should be used as a guide and standard of reference.

2. Literature. One selection from each of the three following groups should be studied in class:

Group I. Goldsmith. The Vicar of Wakefield.
Bacon. Essays.
Emerson. Lincoln.

Group II. Goldsmith. The Deserted Village.
Shakespeare. As You Like It.
Palgrave. Golden Treasury, first series, Books II and III.

Group III. Lincoln. Second Inaugural Address.
Webster. First Bunker Hill Oration.
Schurz. On the Death of Lincoln.

In addition pupils should read and make report on at least one of the following:

Webster's Oration on Adams and Jefferson, Don Quixote, Goldsmith's Vicar of Wakefield, Blackmore's Lorna Doone, Tennyson's The Lotus-Eaters, The Passing of Arthur, Sir Galahad, Ulysses, The Princess, Stevenson's Virginibus Puerisque, Black's Judith Shakespeare, Selections from the Southern Poets.

SUPPLEMENTARY COURSE.

Continue along the same lines as suggested for the first semester.

Third Year English. First Semester—

RECOMMENDED MINIMUM COURSE.

1. Composition and Rhetoric. Pupils should by this time have mastered the details of construction, and be ready to mas-

ter the essential principles governing the selection and organization of materials. Special attention should also be given to diction, and the study of such matters as synonyms and antonyms, specific and general terms, frequent errors in spoken and written English. Using some good text on rhetoric and composition, develop the work in exposition, narration and description, including anecdotes and stories with simple plots. Emphasize proportion in composition.

2. Literature. Study in class at least one from each of the following groups:

Group I. Lincoln. The Gettysburg Address; Last Public Address; Letter to Horace Greeley.
Emerson. Compensation; The American Scholar.

Group II. Shakespeare. Macbeth.
Goldsmith. The Traveler.
Milton. Minor Poems.

2a. As an alternative to the foregoing, a systematic study of English or American Literature, based on some good textbook on the subject, may be taken up. Such a text will suggest and indicate the reading to be done, and the recommendations of the author of the text should be followed out, unless particular circumstances make it necessary, in the judgment of the instructor, to do otherwise. It may be found possible to combine this part of the work with that suggested under (2).

The following are suggested for outside reading:

Franklin's Poor Richard's Almanac, Hawthorne's Marble Faun, Dickens' David Copperfield or Nicholas Nickleby, Old English Ballads, Lodge's Life of Webster (in American Statesmen series), Parkman's Oregon Trail, Stevenson's Master of Ballantrae or Silverado Squatters, Thoreau's Succession of Forest Trees, Wild Apples, Sounds, Warner's My Summer in a Garden.

SUPPLEMENTARY COURSE.

1. Careful study of literature of some particular period.
2. Drill and practice in versification.
3. The writing and delivery of orations and set debates.

Third Year English. Second Semester—

RECOMMENDED MINIMUM COURSE.

1. Composition and Rhetoric. Exposition should be the main feature of the written work of this semester. Practice by the pupils in setting forth their opinions on topics concerning which they have first hand knowledge is valuable. A long theme, from 1,200 to 2,000 words in length, may take up a considerable part of the time, and give the pupil a practical review of the principles established in his study of composition thus far. Thorough study of words and their uses is essential.

2. Literature. Study carefully one from each of the following groups:

Group I. Macaulay. Essay on Milton, Essay on Johnson.
Carlyle. Essay on Burns.
Emerson. Fortunes of the Republic.

Group II. Milton. Comus, L'Allegro and Il Penseroso.
Palgrave, Golden Treasury, Second Series.

Group III. Curtis. The Public Duty of Educated Men.
Washington. Farewell Address.
Webster. First Bunker Hill Oration.

The following are suitable for home reading and reports:

Lamb's Essays of Elia, Browning's Home Thoughts, Clive, Cavalier Tunes, The Boy and the Angel, Thackeray's Henry Esmond, Macaulay's Warren Hastings, Holmes' Autocrat of the Breakfast Table, Dickens' Tale of Two Cities, Rolfe's Boyhood of Shakespeare.

SUPPLEMENTARY COURSE.

Follow the same lines as suggested for the first semester.

Fourth Year in English. First Semester—

RECOMMENDED MINIMUM COURSE.

1. Composition and Rhetoric. Review the principles of narration, description and exposition. Develop the faculty of reading critically and reasoning soundly. Lay emphasis on the development of individual style. Themes of moderate length,

say not over five or six hundred words, should be written, and the writing of a short story or a long essay is urged.

2. Literature. Continue the study of some authoritative work on English literature. In addition, one or more of the following should be studied:

Canto IV of Byron's Childe Harold, The Prisoner of Chillon, Book IV of the first series of Palgrave's Golden Treasury, Chaucer's Prologue, Shakespeare's Hamlet, Wordsworth's Intimations of Immortality, Emerson's American Scholar, Self Reliance, and Compensation.

For home reading the following are recommended:

Macaulay's Essay on Milton, Beowulf, Everyman, additional selections from Tennyson's Idylls of the King, Pope's Essay on Man, Marlowe's The Jew of Malta.

SUPPLEMENTARY COURSE.

1. Debating. At this time, whether the pupils have done so to any extent before or not, emphasis may well be laid on this most useful branch of the work in English. Participation in interscholastic debates is recommended. The young high school graduate can take with him no truer mark of efficiency, as a result of his course, than the ability to reason and argue on his feet in the presence of an audience.

Fourth Year in English. Second Semester—

RECOMMENDED MINIMUM COURSE.

1. Composition and Rhetoric. Thorough drill in expository and argumentative composition, especially the latter. Several themes of moderate length should be written, and at least one argument of considerable length should be developed through formal introduction and brief. The topics chosen should deal with live subjects well within the grasp of the pupils. For girls especially a composition of considerable length may be chosen instead, which should be a final measure of their ability to write.

2. Literature. Complete the work in English Literature, using the adopted text. Burke's Speech of Conciliation should be studied carefully. Huxley's Lay Sermons, including the addresses on Improving Natural Knowledge, A Liberal Education, and A Piece of Chalk are excellent for study at this period.

Palmer's Self Cultivation in English is excellent for home reading, and may well be required. Other outside reading may be assigned from lists already given, or from standard current books and periodicals. Other suitable books for supplementary reading are:

Beecher's Liverpool Speech, Wendell Phillips' Toussaint L'Ouverture, Sumner's The True Grandeur of Nations, Curtis' The Spoils System and Civil Service Reform, Hapgood's Life of Lincoln, Booker T. Washington's Up from Slavery, Howell's The Rise of Silas Lapham.

SUPPLEMENTARY COURSE.

A practical piece of work at this time is to have the student take some timely topic, glean information concerning it from the newspapers and magazines and report from time to time.

SOME SUGGESTED BOOKS.

Among the many books desirable, either as texts or as a working library for high school students of English, the following are suggested. There are many others equally useful. No reference is made to editions of English classics, concerning which teachers seeking information should correspond with the leading publishers:

GROUP I. TEXT AND REFERENCE BOOKS FOR PUPILS.

Alden. The Art of Debate. Holt.
Andrews. Specimens of Discourse. Holt.
Baker. The Principles of Argumentation (revised edition). Ginn.
————. Specimens of Argumentation (modern). Holt.
Baldwin. Specimens of Prose Narration. Holt.
Bates, Arlo. Talks on the Study of Literature. Houghton, Mifflin & Co.
————. Talks on the Writing of English. Houghton, Mifflin & Co.
Brewster. Specimens of Prose Description. Holt.
Burke. Conciliation with America.
Campbell. Handbook of Synonyms and Prepositions. Lee & Shepard.
Carpenter. Rhetoric and English Composition. Macmillan.
Gardiner, Kittredge and Arnold. Manual of Composition and Rhetoric. Ginn.
Gardiner, Kittredge and Arnold. Elements of English Composition. Ginn.
Genung. The Working Principles of Rhetoric. Ginn.
Hanson. English Composition. Ginn & Co.
Herrick and Damon. Composition and Rhetoric. Scott, Foresman & Co.
Hill. Beginnings of Rhetoric and Composition. American Book Co.
Hill. The Principles of Rhetoric. American Book Co.
Hitchcock. Practice Book in English Composition. Holt.

Lamont. English Composition for High Schools. Scribner.
————. Specimens of Exposition. Holt.
Laurie, S. S. Lectures on Language. Macmillan.
Laycock and Spofford. Manual of Argumentation for High Schools. Macmillan.
Lewis. Specimens of the Forms of Discourse. Holt.
McMurry. How to Study. Houghton, Mifflin & Co.
Patterson. First Steps in English Composition. Flanagan.
Scott and Denney. Composition-Rhetoric. Allyn & Bacon.
————. Composition-Literature. Allyn & Bacon.
————. Paragraph-Writing. Allyn & Bacon.
Simons. First Year in English for High Schools. Silver, Burdett & Co.
Thomas & Howe. Composition and Rhetoric. Longmans.
Thorndyke. The Elements of Rhetoric and Composition. Century.
Webster. English Composition and Literature. Houghton, Mifflin & Co.
Wendell. English Composition. Scribner.

GROUP II. USEFUL BOOKS FOR TEACHERS OF ENGLISH.

Carpenter, Baker and Scott. The Teaching of English. Macmillan.
Clark, S. H. How to Teach Reading. Scott, Foresman & Co.
Chubb. The Teaching of English. Macmillan.
Education. Vol. XXV, No. 1, Sept. 1904.
Hinsdale. Teaching the Language Arts. Appleton.
McMurry. Special Method in the Reading of English Classics. Macmillan.
Report of the Committee of Ten on Secondary School Studies. U. S. Bureau of Education.
Sherman and Reed. The Essentials of Teaching Reading. University Publishing Co., Lincoln, Nebraska.
Spalding. The Principles of Rhetoric. Heath.
Thomas. How to Teach English Classics. Houghton, Mifflin Co.
Welch. Literature in the School. Silver, Burdett & Co.

PUBLIC SPEAKING.

GENERAL SUGGESTIONS.

1. One year's work in this subject may be given, under the outline course of study, as an option in the fourth year.

2. To be able to stand on one's feet in the presence of an audience, large or small, and without embarrassment or discomfiture to express one's thoughts in plain straightforward language, is one of the most valuable personal faculties that can be possessed by any individual, and one that will surely be called into requisition sooner or later in the life of an educated man or woman. It is, moreover, a faculty which may be acquired to an effective degree by almost anyone. The only reason why more young people are not trained in this subject is that high school instructors are not willing to put forth the effort, along lines of moral suasion, necessary to get young people to overcome their natural timidity. No pupil should be graduated from a four-year high school until he has a certain considerable amount of training and practice in public speaking.

3. Were our requirements in this work raised and standardized and made reasonably universal, the general standard of efficiency in the teaching profession alone would be measurably raised. Were the ability to say what they know fairly well in public a part of the mental and spiritual equipment of all boys graduating from high school, standards of citizenship and civic activity, which are generated so largely by public discourse, would surely receive an impulse in the right direction. The efficiency of the individual in every professional activity would be measurably increased. More men, who could contribute something to public interest and public thinking, fall short because of deficiency in this respect than for any other single reason.

WHAT THE COURSE MAY CONTAIN.

Rather than attempt to outline a definite, detailed course of study, the aim will be here to suggest the lines of activity that may be carried out. These need not be given in the order named:

1. Drill in the mechanics of speech; breathing and setting-up exercises; vocal drill; study of the mechanics of speech.

2. Study, and memorization of selections from, representative orations. Use selections that illustrate the eloquence of simple language, avoiding ornate rhetoric. Emphasize the necessity of understanding the historical, economic and social conditions which called forth the oration under consideration.

3. Drill in writing, committing to memory, and delivering original composition. Select subjects of present interest, with which the pupils may become familiar at first hand. Local topics are desirable but care should be exercised to avoid the stimulation of local partisan feeling, which is altogether undesirable.

4. Study and memorization of selections from great poems. Use blank verse largely—selections from Shakespeare's plays, Browning's Saul, Tennyson's Ulysses, The Lotus-Eaters, The Psalms, etc.

SUPPLEMENTARY READING LISTS.

The following lists of outside readings are those used in the Seattle high schools. They are printed in the manual for the reason that we believe they will assist many a high school principal or instructor in English to answer the ever-recurring question, what literature, and how much, should high school pupils read under the direction of the instructor?

It is not recommended as necessary, or perhaps even desirable, that every high school should attempt to have in its library all the books mentioned in these lists. A wide range of authors, books and subjects is offered, making the opportunity for the exercise of choice in the matter very considerable.

The requirements of the Seattle high schools are that each semester during the first and second years, about five hundred pages should be read, of which at least two hundred and fifty pages must be other than fiction. Some poetry should be read. During the third and fourth high school years, each pupil is required to read seven hundred and fifty pages of outside reading from these lists of books, each semester, as part of his English work, and at least one-half of such reading must be poetry, or prose that is not fiction.

HIGH SCHOOL READING LIST—FIRST AND SECOND YEARS.

I. Fiction.

Alcott, Louisa May.....Little Women
Alcott, Louisa May.....Old Fashioned Girl
Alcott, Louisa May.....Spinning Wheel Stories
Aldrich, Thomas Bailey.....Marjorie Daw
Allen, James Lane.....Aftermath
Allen, James Lane.....Kentucky Cardinal
Allen, James Lane.....The Choir Invisible
Allen, James Lane.....The Flute and the Violin
Andrews, Mary Shipman.....Bob and the Guides
Andrews, Mary Shipman.....The Perfect Tribute
Aquilon .....Days of Bruce
——— .....Arabian Nights
Barrie, James Matthew.....A Window in Thrums
Barrie, James Matthew.....Sentimental Tommy
Barrie, James Matthew.....The Little Minister
Blackmore, Richard.....Lorna Doone
Brown, Dr. John.....Marjorie Flemming
Brown, Dr. John.....Rab and His Friends
Bulwer-Lytton .....Harold
Bulwer-Lytton .....Last Days of Pompeii
Cable, George Washington.....Creole Days
Cable, George Washington.....Dr. Sevier
Chambers, Robert Williams.....Cardigan
Churchill, Winston.....Richard Carvel
Cooper, James Fenimore.....The Deerslayer
Cooper, James Fenimore.....Afloat and Ashore
Cooper, James Fenimore.....The Pathfinder
Cooper, James Fenimore.....The Pilot
Cooper, James Fenimore.....The Pioneers
Cooper, James Fenimore.....The Prairie
Cooper, James Fenimore.....The Spy
Cooper, James Fenimore.....The Two Admirals
De Foe, Daniel.....Robinson Crusoe
De Morgan, William F.....Alice for Short
De Morgan, William F.....Joseph Vance
Dickens, Charles.....Christmas Stories
Dickens, Charles.....Dombey and Son
Dickens, Charles.....Great Expectations
Dickens, Charles.....Nicholas Nickleby
Dickens, Charles.....Old Curiosity Shop
Dickens, Charles.....Oliver Twist
Dickens, Charles.....The Christmas Carol
Eggleston, Edward.....The Hoosier Schoolmaster
Eliot, George.....Mill on the Floss
Eliot, George.....Scenes from a Clerical Life
Ewing, Juliana Horatia.....Jan of the Windmill
Ewing, Juliana Horatia.....Six to Sixteen
Fox, John, Jr.....Little Shepherd of Kingdom Come
Fraser, Mrs. Hugh.....In the Fear of the Lord
Frederick, Harold.....In the Valley
Gaskell, Elizabeth Cleghorn.....Cranford
Gordon, Charles William.....The Sky Pilot
Hale, Edward Everett.....Back to Back
Hale, Edward Everett.....Stories of War
Hale, Edward Everett.....Stories of the Sea
Hale, Edward Everett.....The Man Without a Country

Harte, Bret.....The Luck of Roaring Camp
Hawthorne, Nathaniel.....Rappaccini's Daughter
Hawthorne, Nathaniel.....Tanglewood Tales
Hawthorne, Nathaniel.....The Snow Image
Hawthorne, Nathaniel.....The Wonder Book
Hawthorne, Nathaniel.....Twice Told Tales
Howells, William Dean.....A Traveler From Altruria
Howells, William Dean.....The Lady of the Aroustock
Hughes, Thomas.....Tom Brown at Oxford
Hughes, Thomas.....Tom Brown's School Days
Hugo, Victor Marie.....Les Miserables
Jackson, Helen Hunt.....Ramona
Jewett, Sarah Orne.....A Country Doctor
Jewett, Sarah Orne.....Betty Leicester
Jewett, Sarah Orne.....Tales of New England
Kingsley, Charles.....Hereward the Wake
Kingsley, Charles.....Westward Ho!
Kipling, Rudyard.....Captains Courageous
Kipling, Rudyard.....Indian Tales
Kipling, Rudyard.....Kim
Kipling, Rudyard.....Puck of Pook's Hill
Kipling, Rudyard.....The Jungle Books
Lamb, Charles and Mary.....Adventures of Ulysses
Lamb, Charles and Mary.....Tales From Shakspere
London, Jack.....The Call of the Wild
Malory, Sir Thomas.....Morte d'Arthur
Olivant, Alfred.....Bob, Son of Battle
Ouida (Louise de la Ramee).....The Dog of Flanders
Phelps, Elizabeth Stuart.....The Madonna of the Tubs
Scott, Sir Walter.....Kenilworth
Scott, Sir Walter.....Old Mortality
Scott, Sir Walter.....Rob Roy
Scott, Sir Walter.....Tales of a Grandfather
Scott, Sir Walter.....The Abbott
Scott, Sir Walter.....The Heart of Midlothian
Scott, Sir Walter.....The Talisman
Seton, Ernest Thompson.....Wahb
Seton, Ernest Thompson.....Wild Animals I Have Known
Smith, Francis Hopkinson.....Gondola Days
Stevenson, Robert Louis.....David Balfour
Stevenson, Robert Louis.....Kidnapped
Stevenson, Robert Louis.....The Black Arrow
Stevenson, Robert Louis.....The Bottle Imp
Stevenson, Robert Louis.....The Master of Ballentrae
Stevenson, Robert Louis.....Treasure Island
Stockton, Frank Richard.....Rudder Grange
Stockton, Frank Richard.....Selected Short Stories
Stowe, Harriet Beecher.....Uncle Tom's Cabin
Twain, Mark (Sam'l Langhorne Clemens).....Innocents Abroad
Twain, Mark (Sam'l Langhorne Clemens).....Life on the Mississippi
Twain, Mark (Sam'l Langhorne Clemens).....Tom Sawyer
Van Dyke, Dr. Henry.....The Blue Flower
Van Dyke, Dr. Henry.....The Other Wise Man
Wallace, Lew.....Ben Hur
Warner, Charles Dudley.....Being a Boy
Watson, John (Ian Maclaren).....Days of Auld Lang Syne
Watson, John (Ian Maclaren).....The Bonnie Briar Bush
White, Stewart Edward.....The Blazed Trail
White, Stewart Edward.....The Forest

White, W. A.....The Real Issue
Wiggin, Kate Douglas.....Diary of a Goose Girl
Wiggin, Kate Douglas.....The Birds' Christmas Carol
Wiggin, Kate Douglas.....The Story of Patsy
Wilkins, Mary E.....Selected Short Stories
Winthrop, Theodore.....John Brent

II. Non-Fiction.

Abbott, Charles C.....A Naturalist's Rambles About Home
Addison, Joseph.....Meserole's Selections from the Spectator
Ainsworth, William Harrison.....Old Saint Paul's
Ainsworth, William Harrison.....Tower of London
Alcott, Louisa May.....Hospital Sketches
Lord Avebury, John Lubbock.....Ants, Bees and Wasps
Bailey, Mrs. Florence Augusta.....A-birding on a Bronco
Bates, Henry W.....Naturalist on the River Amazon
Blanchan, Mrs. Nellie.....Bird Neighbors
Blanchan, Mrs. Nellie.....Birds That Hunt and Are Hunted
Drummond, Henry.....The Ascent of Man
Bolton, Sarah Knowles.....Historic Boys
Bolton, Sarah Knowles.....Historic Girls
Brooks, Noah.....First Across the Continent
Buckley, Arabella B.....Winners in Life's Race
Bunyan, John.....Pilgrim's Progress
Burroughs, John.....Birds and Bees
Burroughs, John.....Birds and Poets
Burroughs, John.....Field Notes
Burroughs, John.....Locusts and Wild Honey
Burroughs, John.....Pepacton
Burroughs, John.....Signs and Seasons
Burroughs, John.....Wake-robin
Carlyle, Thomas.....Heroes and Hero Worship
Chisholm, Edwin.....Old Testament Stories
Crawford, Francis M.....The Little City of Hope
Dana, Richard Henry.....Two Years Before the Mast
Darwin, Charles.....Earthworms
Darwin, Charles.....Insectivorous Plants
Darwin, Charles.....Naturalist's Voyage Round the World
DeQuincy, Thomas.....Joan of Arc
DeQuincy, Thomas.....The English Mail Coach
Dickens, Charles.....A Child's History of England
Duncan, Norman.....Dr. Luke of Labrador
Dunn, Martha Baker.....Cicero in Maine
————.....Escapes of th Civil War
————.....Famous Adventures and Prisons
Fields, James Thomas.....Yesterdays with Authors
Forster, John.....Life of Dickens
Franklin, Benjamin.....Autobiography
Froude, James Anthony.....Life of Caesar
Goldsmith, Oliver.....A Citizen of the World
Grant, Ulysses Simpson.....Memoirs
Hale, Edward Everett.....Memories of a Century
Hay, John.....Castilian Days
Holmes, Oliver Wendell.....Autocrat of the Breakfast Table
Holmes, Oliver Wendell.....Over the Teacups
Huxley, Thomas H.....American Addresses
Huxley, Thomas H.....Critiques and Addresses
Huxley, Thomas H.....Lay Sermons
Huxley, Thomas H.....Man's Place in Nature

Huxley, Thomas H.....Science and Culture
Irving, Washington .....Alhambra
Irving, Washington .....Astoria
Irving, Washington .....A Tour on the Prairies
Irving, Washington .....Abbotsford
Irving, Washington .....Captain Bonneville
Irving, Washington .....Conquest of Granada
Irving, Washington .....Life of Columbus
Jenks, Tudor.....In the Days of Shakspere
Job, Herbert Keightley.....Among the Water Fowl
Job, Herbert Keightley.....Wild Wings
Jordan, David Starr.....Science Sketches
Jordan, David Starr.....Footnotes to Evolution
Keller, Helen.....The Story of My Life
Keller, Helen.....The World I Live In
Kingsley, Charles .....Greek Heroes
Lamb, Charles .....Dissertation on Roast Pig
Lamb, Charles .....Essays of Elia
Lamb, Charles .....Praise of a Chimney Sweep
Lanier, Sidney.....Boys' Froissart
Lanier, Sidney.....Boys' King Arthur
Lord Aveburg, John Lubbock.....Ants, Bees and Wasps
Lowell, James Russell.....Fireside Travels
Lowell, James Russell.....My Study Windows
Macaulay, Thomas Babington..Essays on Clive, Hastings, Bunyan, Pitt
Maeterlinck, Maurice.....Life of the Bee
Miller, Mrs. Harriet .....A Bird Lover in the West
Miller, Mrs. Harriet .....Birdways
Miller, Mrs. Harriet .....In Nesting Time
Miller, Mrs. Harriet .....Little Brothers of the Air
Miller, Mrs. Harriet.....True Stories from My Note Books
Miller, Mrs. Harriet .....Upon the Tree Tops
Morris, William.....Apology in Earthly Paradise
Motley, John Lothrop.....Rise of the Dutch Republic
Nicolay, John George.....Boys' Life of Lincoln
Palmer, George Herbert.....Translation of Odyssey
Parkman, Francis.....Montcalm and Wolf
Parkman, Francis.....The Conspiracy of Pontiac
Parkman, Francis.....The Discovery of the Great West
Parkman, Francis.....The Oregon Trail
Plutarch .....Lives
Prescott, William Hinkling.....Conquest of Mexico
Prescott, William Hinkling.....Conquest of Peru
Riis, Jacob.....The Making of an American
Rolfe, William James.....Boyhood of Shakspere
Roosevelt, Theodore.....Hero Stories from American History
Roosevelt, Theodore.....The Winning of the West
Ruskin, John.....King of the Golden River
Ruskin, John.....Letters to C. E. Norton
Ruskin, John.....Modern Painters, Vol. 3
Schurz, Carl.....Life of Henry Clay
Schurz, Carl.....Reminiscences
Scudder, Samuel Hubbard.....The Life of a Butterfly
Southey, Robert.....Life of Nelson
Stevenson, Robert Louis.....An Inland Voyage
Stevenson, Robert Louis .....Letters
Stevenson, Robert Louis .....Travels with a Donkey
Stevenson, Robert Louis .....Virginibus Puerisque
Stoddard .....Lectures

Thackeray, William Makepeace.....Roundabout Papers
Thackeray, William Makepeace.....The Four Georges
Thompson, J. Arthur.....Science and Life
Tydball, John.....Fragments of Science
Van Dyke, Dr. Henry J.....Days Off
Van Dyke, Dr. Henry J.....Fisherman's Luck
Warner, Charles Dudley.....In the Wilderness
Washington, Booker T.....Up from Slavery
Weed, Clarence Moores.....Seed Travelers
Wister, Owen.....Seven Ages of Washington
Wright, Mrs. Mabel Osgood.....Birdcraft

III. Poetry.

Selections will be made from the works of the following poets. Students should be encouraged to read at least twenty-five pages of poetry each semester. Credit as non-fiction.

Arnold, Matthew
Aytoun, William E.
Browning, Robert
Bryant, William Cullen
Burns, Robert
Byron, Lord
Doyle, Arthur Conan
Gayley, Chas. Mills
Halleck, Fitz-Greene
Hunt, Leigh
Kipling, Rudyard
Kingsley, Chas.
Lowell, James Russel
Mabie, Hamilton W.
Macaulay, Thomas B.
Palgrave
Scott, Sir Walter
Shakspere, William
Southey, Robert
Stevenson, R. L.
Whittier, John Greenleaf
Wolfe, Charles

THIRD YEAR.

I. Fiction List.

Austen, Jane.....Pride and Prejudice
Austen, Jane.....Sense and Sensibility
Black, William.....Judith Shakespeare
Bulwer-Lytton, Edward G.....Last of the Barons
Cervantes, Miguel .....Don Quixote
Cody, Sherwin.....The World's Greatest Short Stories
Cox, George Wm.....Popular Romances of the Middle Ages
Curtis, George Wm.....Sidney
Dickens, Charles .....Pickwick Papers
Dickens, Charles .....Our Mutual Friend
Dickens, Charles .....Hard Times
Eliot, George.....Adam Bede
Eliot, George.....Felix Holt
Hope, Anthony.....Prisoner of Zenda
Mandeville, Sir John.....Voyages and Travels
More, Robert .....Jessemy Bride
More, Sir Thomas.....Utopia
Matthews, Brander.....A Collection of Short Stories
Parker, Gilbert.....In the Seats of the Mighty
Reade, Charles.....Cloister and Hearth
Scott, Walter .....Waverly
Scott, Walter .....The Monastery
Scott, Walter .....The Abbot
Scott, Walter .....Guy Mannering
Sidney, Sir Phillip.....Arcadia
Stevenson, Robert Louis.....Will o' the Mill

Stevenson, Robert Louis.....The Merry Men
Stevenson, Robert Louis .....Kidnapped
Stevenson, Robert Louis.....Dr. Jekyl and Mr. Hyde
Swift, Jonathan.....Tale of a Tub
Thackeray, Wm. Makepeace.....Vanity Fair
Thackeray, Wm. Makepeace.....Henry Esmond
Thackeray, Wm. Makepeace.....The Newcomes
Walpole, Horace.....The Castle of Otranto

II. Non-Fiction List.

Anderson, Hans Christian.....The Story of My Life
Arnold, Matthew .....Essays
Arnold, Matthew .....Culture and Anarchy
Arnold, Matthew .....Thomas Gray
Bacon, Francis .....Essays
Bancroft, George.....History of the United States
Boswell, James .....Life of Dr. Johnson
Brandes, George Select Chapters from "Wm. Shakespeare"
Browning, Robt. and Mrs.....Letters
Bunyan, John.....Holy War
Burke, Edmund.....Reflections on the French Revolution
Carlyle, Thomas .....History of the French Revolution
Carlyle, Thomas .....Sartor Resartus
Carlyle, Thomas .....Essays
Coleridge, Samuel Taylor.....Biographia Literaria
Cross, Wilbur.....The Development of the English Novel
DeQuincey, Thomas.....Flight of the Tartar Tribe
DeQuincey, Thomas.....Essays, Selected
Dryden, John .....Essays
Franke, Kuno.....History of German Literature
Gardner, Samuel .....History of the French Revolution
Gardner, Samuel .....History of England
Gibbon, Edward .....Decline and Fall of the Roman Empire
Gibbon, Edward .....Memoirs
Goldsmith, Oliver.....She Stoops to Conquer
Green, John Richard.....Short History of the English People
Hamilton, Madison and Jay.....The Federalist
Hare, Augustus.....Walks in Rome
Harrison, Frederick.....On the Choice of Books
Huxley, Thomas Henry.....Fragments of Science
Huxley, Thomas Henry .....Autobiography
Jameson, Mrs. Anna.....Shakespeare's Heroines
Johnson, Harold Whetstone.....Private Life of the Romans
Jusserand, Jean Jules.....English Wayfaring Life in the 14th Century
Kingsley, Charles.....The Roman and the Teuton
Landor, Walter Savage.....Aerope and Rodope
Lee, Sidney.....Life of Shakespeare
Lockhard, Joseph G.....Life of Scott
Lowell, James Russel.....Essays on
Chaucer, Spenser, Marlow, Shakespeare, Pope and Wordsworth
Mabie, Hamilton Wright.....Shakespeare—Poet, Dramatist, Man
Mabie, Hamilton Wright.....Norse Legends
Macaulay, Thomas Babington.....History of England
Macaulay, Thomas Babington.....
.....Essays on Bunyan, Clive, Warren Hastings and others
Milton, John.....Areopagitica
Morley, John.....English Men of Letters
Mitchell, Donald G.....English Lands, Letters and Kings

Morris, Charles.....English History Tales
Newman, John Henry.....Idea of a University
Pater, Walter H.....Appreciations
Percy, Thomas.....On the Ancient Minstrels
Ruskin, John.....Stones of Venice
Ruskin, John.....Ethics of the Dust
Ruskin, John.....Crown of Wild Olive
Snider, Denton J.....Walks in Hellas
Stedman, Edmond Clarence.....Victorian Poets
Stephenson .....Shakespeare's London
Stevenson, Robert Louis.....An Apology for Idlers
Thackeray, Wm. Makepeace....English Humorists of the 18th Century
Ticknor, George.....History of Spanish Literature
Walton, Izaak.....The Complete Angler
Ward, Thomas Humphrey.....English Poets
Wordsworth, Wm. .....Essays

III. Poets From Whose Works Selections Will Be Made.

Arnold, Matthew
Beowulf
Blake, William
Browning, Robert
Browning, Elizabeth Barrett
Burns, Robert
Byron, George Gordon
Campbell, Thomas
Carew, Thomas
Chaucer, Geoffrey
Coleridge, Samuel Taylor
Collins, William
Cowper, William
Dryden, John
Dunbar, William
Goldsmith, Oliver
Gray, Thomas
Herrick, Robert
Hood, Thomas
Keats, John
Kingsley, Charles
Kipling, Rudyard
Landor, Walter Savage
Lovelace, Richard
Macaulay, Thomas Babington
Macpherson, James
Milton, John
Marlowe, Christopher
Moore, Thomas
Morris, William
Newman, John Henry
Phillips, Stephen
Pope, Alexander
Proctor, Bryan Walker
Rossetti, Dante Gabriel
Scott, Walter
Shakespeare, William
Shelley, Percy Bysshe
Southey, Robert
Spenser, Edmund
Stevenson, Robt. Louis
Suckling, Sir John
Tennyson, Alfred
Swinburne, Algernon
Thomson, James
Watson, William
Wordsworth, William

FOURTH YEAR.

I. Fiction.

Allen, James L.....The Choir Invisible
Allen, James L.....Aftermath
Allen, James L.....Kentucky Cardinal
Cable, George W. .....Bonaventura
Cable, George W. .....The Grandissimes
Cable, George W. .....Gregorie's Island
Churchill, Winston.....The Crisis
Cody, Sherwin.....The World's Greatest Short Stories
Curtis, George Wm.....Prue and I
Foote, Mary Halleck.....Coeur d'Alene
Harte, Francis Bret.....Luck of Roaring Camp
Hawthorne, Nathaniel.....Marble Faun
Hawthorne, Nathaniel .....The Scarlet Letter

Hawthorne, Nathaniel.....Blithedale Romance
Hope, Anthony.....Prisoner of Zenda
Howells, William Dean.....Their Wedding Journey
Howells, William Dean.....The Rise of Silas Lapham
Howells, William Dean.....The Traveler from Altruria
James, Henry.....The Bostonians
Jewett, Sarah Orne.....Tales of New England
Longfellow, Henry W.....Kavanagh
Matthews, Brander.....Collection of Short Stories
Meredith, George.....Diana of the Crossways
Page, Thomas Nelson.....Red Rock
Smith, Francis Hopkinson.....Col. Carter of Cartersville
Smith, Francis Hopkinson.....Tom Gregor
Smith, Francis Hopkinson.....Wood Fire
Stowe, Harriet Beecher.....The Minister's Wooing
Twain, Mark.....A Yankee at King Arthur's Court
Wister, Owen.....The Virginian

II. Non-Fiction.

American Men of Letters Series.....
American Statesmen Series.....
Beecher, Henry Ward.....Patriotic Addresses
Burke, Edmund.....Letter to a Noble Lord
Burke, Edmund.....Speech on American Taxation
Burke, Edmund.....Speech on Trial of Warren Hastings
Burke, Edmond.....Speech on Nabob of Arcot's Debts
Burroughs, John .....Essays
Burroughs, John .....A Bunch of Herbs
Burroughs, John .....Hard Fare
Cicero, Marcus Tullius.....On Friendship
Curtis, George Wm.....Addresses on Civil Service Reform
Curtis, George Wm.....Our Best Society
Emerson, Ralph Waldo.....Essays
Fiske, John.....American Ideals
Fiske, John.....The Critical Period
Fiske, John.....The Destiny of Man
Hamilton, Madison and Jay.....The Federalist
Holmes, Oliver Wendell.....Poet at the Breakfast Table
Irving, Washington.....Knickerbocker's History of New York
Irving, Washington.....Life of Goldsmith
Irving, Washington.....Mahomet and His Successors
Jefferson, Thomas .....Autobiography
Jefferson, Thomas .....Notes on Virginia
Larcom, Lucy.....A New England Girlhood
Lincoln, Abraham.....Debates with Douglas
Lincoln, Abraham.....Inaugural Addresses
Lincoln, Abraham.....Emancipation Proclamation
Lowell, James Russell.....Among My Books
Lowell, James Russell.....Literary Essays
Lowell, James Russell.....Democracy and Other Addresses
Mabie, Hamilton Wright.....Short Studies in Literature
Mabie, Hamilton Wright .....Essays
Mabie, Hamilton Wright.....My Study Fire
Mabie, Hamilton Wright.....Under the Trees and Elsewhere
Mitchell, Donald G.....Reveries of a Bachelor
Motley, John Lothrop.....United Netherlands
Parkman, Francis.....Old Regime in Canada
Perry, Bliss.....Study of Prose Fiction

Prescott, William Hickling.....Ferdinand and Isabella
Prescott, William Hickling.....Phillip II
Repplier, Agnes.....Essay on Idleness
Stedman, Edmund Clarence.....American Anthology
Stedman, Edmund Clarence.....American Poets
Sumner, Charles.....The True Grandeur of Nations
Thoreau, Henry David.....Walden
Thoreau, Henry David.....Week on the Concord and Merrimac Rivers
Ticknor, George.....History of Spanish Literature
Van Dyke, Henry.....Essays
Warner, Charles Dudley.....My Summer in a Garden
Washington, George.....Farewell Address
Washington, George.....Correspondence
Webster, Daniel.....Speech on the White Murder Trial
Wendell, Barrett.....Literary History of America
Winter, William.....Grey Days and Cold
Woolman, John.....Journal

III. Poets From Whose Works Selections Will Be Made.

Bryant, Wm. Cullen	Markham, Edwin
Dunbar, Paul Lawrence	Poe, Edgar Allan
Emerson, Ralph Waldo	Read, Thomas Buchanan
Field, Eugene	Riley, James Whitcomb
Freneau, Philip	Saxe, John Godfrey
Halleck, FitzGreene	Sill, Edward Rowland
Harte, Francis Bret	Stedman, Edmond Clarence
Holmes, Oliver Wendell	Taylor, Bayard
Longfellow, Wm. Wadsworth	Whitman, Walt
Lowell, James Russell	Whittier, John Greenleaf

BEGINNING ALGEBRA.

General Suggestions—

1. The most practical value of algebra lies in its use as a mental implement; (1) in rendering complex mathematical conditions simple, and (2) in making accurate and comprehensive generalizations. The whole subject should be attacked with these fundamental purposes in mind. When a literal expression is substituted for a numerical one, the process is essentially one of simplifying expressions. This fact should be strongly emphasized in all such operations as those of complex fractions, cancellation and radicals.

2. Algebraic expressions are particularly useful as generalizations. Pupils should early master the principle that every literal expression in the various mathematical operations—addition, subtraction, multiplication, division, involution and evo-

lution—states a fact in regard to members which may be translated into terms easily understood by people who have no technical knowledge of algebra. The binomial theorem is of the highest value as an instrument of generalization; it states in a single way a group, or series of mathematical propositions which can never fail to be true.

3. Too much emphasis cannot be laid on the necessity of thoroughly mastering the language and phraseology of algebra. His introduction to the subjects of algebra brings the ninth grade pupil in contact with words which are at first almost as foreign to him as Sanscrit. He must really know the meaning of, not merely memorize, a considerable vocabulary, the meaning of every word of which should be made as clear to him as *house*, or *cat*, or *father*. All experience shows the great need of care that even the simplest expressions be not misunderstood. By no other means can the pupil appropriate to himself the great advantage of thinking in letters and symbols in reasoning processes instead of using long and involved literary expressions, as he was accustomed to do while he was studying arithmetic in the grades.

4. The best tests of efficiency are problems, factoring, radicals and the theory of exponents. Instructors should insist on having results accurately checked and verified as soon as obtained, and so make the student as independent of printed answers as may be. When students at the board have reached a result, they should prove that the result is or is not correct. Independent thinking is a high measure of personal efficiency, and there is no surer means of developing independent thinkers than by the habit of proving the logic of results. One independent thinker is worth a host of mere followers of memorized rules and formulas. Mathematics is entitled to its prominence in the course of study as a means of developing the power to think accurately and reason to logical conclusions only when independent thinking is encouraged by the habit of proving the work.

First Year Algebra—

This work is continuous throughout the year, and may be covered with any one of a large number of books on the subject as the text. For the reason that text-books differ in arrangement of subjects, the following arrangement may require modification. The facility with which classes will master the first part of a year's work will be determined by the degree of thoroughness with which they have covered the mathematics of the eight elementary grades.

First Semester—

RECOMMENDED MINIMUM COURSE.

1. The four fundamental operations, including the ability to state definitions in clear, concise language, to represent quantities and indicate mathematical relations and operations by means of algebraic symbols, to translate symbolic expressions into words, to add, subtract, multiply and divide monomials and polynomials with numerical coefficients and exponents.

2. Factoring, involving the ability to recognize a monomial factor whenever present, and familiarity with the factors of all typical binomial, trinomial and polynomial forms; the application of these principles in finding the H. C. F. and L. C. M. only in cases that can be factored. Emphasize the clear presentation of all written work.

3. The solution of equations containing one unknown, and of simultaneous equations containing two unknown quantities. The graph may well be introduced and used extensively at this time.

Second Semester—

RECOMMENDED MINIMUM COURSE.

1. Fractions, including reduction by factoring; multiplication, division, least common denominator; addition and subtraction; changing to and from mixed expressions.

2. The solution of simultaneous equations in three unknowns, and fractional equations.

3. Practice in the reduction of fractional forms involving all possible methods of factoring.

4. Introduction to involution, evolution, and the solution of the quadratic equation.

(NOTE: The foregoing arrangement is more suggestive than required. It may be found desirable, owing to the arrangement of work in the text used, to vary therefrom, and is permissible in such cases.)

Throughout the Year—

SUPPLEMENTARY WORK.

The best supplementary work consists of problems involving and giving new applications of principles already touched. In other words, the most practical supplementary work should take the form of review work. It is not necessary to introduce such features as intricate problems in equations, fox and hound "leap" problems, rowing up or downstream problems, but practical exercises that will tend to connect the student's mathematical learning with the life he is to lead are most desirable. Other possible features are:

1. Radicals, including necessary definitions and reduction; square root of polynomial algebraic expressions; radical equations.

2. Solution of quadratics by factoring and completing the square.

3. Ratio and proportion, with particular stress on practical application.

4. Simple cases of equations involving two or more unknowns, solvable by the methods of simple or quadratic equations; homogeneous equations of the second degree; symmetric equations of the third or fourth degree; H. C. F. and L. C. M. in cases of expressions which cannot be factored by inspection.

5. Problems involving quadratic equations.

ADVANCED OR INTERMEDIATE ALGEBRA.

General Suggestions—

1. Intermediate algebra should consist of a review of the work done in the first year, with enough additional work to meet college entrance requirements. Work omitted from the first year course because of being too difficult should be inserted.

2. The theoretical side of the subject should receive attention, and the student, with his experience in formal demonstration in geometry, should be required to demonstrate many of the theorems of algebra.

3. This course should be given not earlier than the third year, if no other work in mathematics is to follow. It may come in the fourth year, although it is not likely that such will become a general practice.

RECOMMENDED MINIMUM COURSE.

1. A thorough review of factoring. This will necessitate a review of the special laws of multiplication and division. Proof and application of the factor theorem.

2. Highest common factor and lowest common multiple by factoring, and by the long division method.

3. Emphasize the work in fractions. Give special attention to the laws for changing signs. Take up continued fractions.

4. Simultaneous equations, with emphasis on elimination by subtraction; equations involving more than two unknowns.

5. Involution and evolution, with special attention to cube root of algebraic and numerical quantities.

6. Theory of exponents. Proof of important theorems.

7. Radicals. The work of reducing radicals to simplest form cannot be over-emphasized. Radical equations.

8. Quadratic equations, and equations in quadratic form. The solution of quadratics by factoring and by the formulas should be emphasized.

9. Simultaneous quadratics.

10. Theory of quadratic equations, and the writing of the equation when the roots are given.

11. Ratio, proportion and variation.

SUPPLEMENTARY WORK.

1. The progressions.
2. Inequalities.
3. Imaginaries.
4. Variables and limits.
5. Interpretation of results.
6. Indeterminate forms.
7. Logarithms.
8. Determinants.

PLANE GEOMETRY.

General Suggestions—

1. The result of a good high school course in geometry should be to establish in the mind of the pupil a conception of practical logic, and to cultivate his capacity for accurate and sustained reasoning. From a practical standpoint, emphasis should be laid on the inventive phase of the student's mental activity.

2. The successful teacher of high school geometry should never lose sight of one cardinal point—that a mastery of the subject consists not in a more or less accurate knowledge of any given set of theorems, but in the ability to grasp firmly and clearly the underlying processes and concepts, and to arrive quickly at the right method of attack whenever a new problem presents itself.

3. As in the case of algebra, the course outlined in geometry cannot be divided into semesters without going into detail much more than the limits of the present work will permit. Hence, the work is outlined for a year, leaving to the wisdom of the instructor and the capacity of the class the amount that should be covered in any semester.

RECOMMENDED MINIMUM COURSE.

1. The usual theorems, propositions and constructions of any good, standard text-book. The course should cover the

fundamental properties of lines and angles, parallel and perpendicular lines, triangles, parallelograms, quadrilaterals and polygons; the circle and the theory of limits; similar figures and the theory of proportional area of polygons; the regular polygons and the computation of the circumference of the circle in terms of the diameter.

2. Whatever text-book or method is used, the time devoted to the subject should be divided in the most practical proportions between the proof of the formal theorems and propositions, "original" exercises, and experimental work involving the application of geometrical principles to problems of construction and the measurement of lines and plane surfaces.

The Department of Mathematics of the State University recommends that "the formal proofs of theorems and propositions should not occupy more than one-third of the time allotted to geometry. Another third should be given to "original" exercises carefully written out in a notebook kept for that purpose and this should be insisted upon as a part of the required work of the course. The remaining third of the time should be given to experimental work, the construction of models, the use of squared paper, the measuring of lines and areas, numerical verification of results, and accurate work in geometrical constructions. For this purpose every student should be provided with a graduated straightedge, a pair of compasses, a protractor and a geometrical drawing tablet." This suggestion is an excellent one, and represents an arrangement of the work in geometry toward which the high school instructors in mathematics may well aim, to be approximated as soon as individual circumstances will permit.

SUPPLEMENTARY WORK.

1. Maxima and minima.
2. Symmetrical figures.
3. Theorems, for which sight proof are demanded, preferably those that may be proved by application of very few fundamental principles.
4. Problems of construction involving loci.

SOLID GEOMETRY.

NOTE: The outline course of study by the State Board places advanced algebra in the first semester, and solid geometry in the second semester of the third year of the high school work. There is no reason why this order may not be reversed, if in the judgment of the instructor particular circumstances render it advisable. The arrangement of this part of the work may have some influence in determining the degree to which algebraic constructions will be introduced in the study of solid geometry.

RECOMMENDED MINIMUM COURSE.

1. The relation of planes and lines in space.

2. Dihedral and polyhedral angles.

3. The properties and measurements of prisms, pyramids, cylinders and cones.

4. The sphere and the spherical triangle.

5. As in plane geometry, so in solid geometry the solution of "originals" should constitute an integral part of the required work. Wherever possible, the student should be required to construct for himself models of the solids which he is studying, either of wood, plaster of Paris, or cardboard. Emphasis should be put also on the accurate construction of figures on the blackboard.

SUPPLEMENTARY COURSE.

1. The demonstration of additional original propositions and a solution of loci problems.

2. The application of the facts of solid geometry to the solution of numerical and algebraic exercises.

3. The mensuration of surfaces and solids, disconnected and adjacent.

TRIGONOMETRY.

NOTE: This subject is optional and only offered at present in a comparatively small number of our large city high schools. For this reason it will be necessary here only to outline briefly the semester's work, which may be given in either semester of the fourth year of the high school course. This should include:

1. Trigonometric functions of an acute angle.
2. Solution of right triangles of natural functions.
3. Theory and use of logarithms, using five-place tables.
4. Logarithmic solution of right triangles.
5. Functions of an obtuse angle.
6. Properties of triangles.
7. Solution of oblique triangles.
8. The general angle and its measures.
9. Functions of any angle.
10. Functions of two or more angles.
11. Solution of simple trigonometric equations, and the construction of simple trigonometric graphs.

SUPPLEMENTARY WORK.

1. A more comprehensive study of the solution of trigonometric equations.
2. A more comprehensive study of trigonometric graphs.
3. The calculation of logarithms and tables of trigonometric functions.

LATIN.

General Suggestions—

1. The outline course of study provides four years' work in Latin. In many of the smaller high schools not more than two years of Latin can, or should be attempted. A very good arrangement in a moderate-sized high school is to offer two years of Latin and two of German. One year of either is of little worth.

2. Among the advantages of the study of Latin are: (a) Development of a critical judgment; (b) giving mental discipline; (c) since a very large proportion of the words of English speech are of Latin origin, the study of Latin develops understanding and accuracy and clearness of expression; (d) it is the only proper basis for the study of French, Italian and Spanish; (e) it introduces the pupils to the logic and categories of general grammar; (f) it affords the key to modern civilization which is interwoven through and through with the warp and woof of Roman institutions, law, literature and general culture.

3. No attempt has been made to divide any year's work in Latin into semesters. The work of each year is complete in itself, and the particular amount that will be covered during the first semester will vary with the strength and previous training of any given class.

First Year—

RECOMMENDED MINIMUM COURSE.

1. Complete and master the essential features of any standard text-book in first year Latin. This should include the following:

(a) The acquisition of a working vocabulary of from 400 Latin words up.

(b) The mastery of the more common constructions, and of the regular and common irregular forms, which requires frequent oral and written review.

(c) Frequent practice in declining nouns, pronouns and adjectives, conjugating verbs, and comparing adjectives and adverbs.

(d) After the class is fairly well started in the work, oral and written translation from Latin into English and from English into Latin should be an important part of almost every recitation. Nothing can take the place of constant drill in first year Latin.

2. The study from English sources of the life and time of the Roman people (see list of recommended books).

3. Drill in word formation and English words derived from the Latin. This is a most practical way of connecting the study of Latin with the daily life of the pupil.

4. Practice in writing and learning easy conversational sentences—a good way to increase interest in the subject.

SUPPLEMENTARY WORK.

1. Frequent drill on sentences either devised by the teacher himself, or taken from some supplementary text-book.

2. Additional readings (covering 25-50 pages) from Fabulae Faciles, Viri Romae Illustres, or perhaps Eutropius.

3. Drill in additional rules of Latin grammar, taken from some good grammar text in the hands of the teacher. The material in the regular text will suggest the need of this kind of work from time to time to any competent teacher.

Second Year—

RECOMMENDED MINIMUM COURSE.

1. The translation of at least three and one-half books of Caesar de Bello Gallico, or the translation of its equivalent from any standard second year book, many of which are now in use, containing selections from Caesar and other Latin writers of equally easy prose. The following points should be included:

(a) Informal discussions by the teacher of the formation of the First Triumvirate, the terms of Caesar's proconsulate and the constitutional questions involved; events leading up to the Civil war showing Caesar as a source for the history of the period; the Roman army, arms, organization, officers and equip-

ment; the geography of Gaul and the topography of the battle-fields.

(b) Get the story of the selection being read. Avoid awkward "translation English" and seek to give the pupils freedom in the use of idiomatic language. Remember that idioms formed a large part of the conversation and composition of the Romans, as they do of our own.

(c) Emphasize grammatical construction. No word or expression should be gone over without having its relation to the context made clear. Take advantage of every possible opportunity to show the application of the rules of grammar. Give frequent drills in declension, conjugation, and comparison.

2. The study in class and by assignment of a standard Latin grammar.

3. Latin composition at least once a week on the average.

SUPPLEMENTARY WORK.

1. Easy sight reading of simple prose selections. This will help to vary the "grind."

2. Translation of additional matter. Strong classes, under stimulating and enthusiastic teachers, can cover from four to six books of Caesar, or its equivalent, in a year.

3. Drill and review in word-formation, and study of English words derived from the Latin.

4. Special study of two or three of the important battles.

Third Year—

RECOMMENDED MINIMUM COURSE.

1. Study the life and times of Cicero. Emphasize the place of oratory, before the invention of printing, in moulding public opinion. Nothing is deader than Cicero's writing without his spirit; nothing more keenly alive than the soul of Cicero's work.

2. Translate at least the first three of Cicero's orations *in Catilinam*, and two of the following: *Pro Lege Manilia, In C. Verrem*, and *Pro A. Licinio Archia Poeta.*

3. A careful study of the structure of each oration.

4. Latin prose composition, one recitation per week on the average. Aim at developing the oratorical style. The papers should be carefully corrected and returned with each day's work, so that the pupil may understand his errors.

5. Study of a standard Latin grammar, as in the second year.

SUPPLEMENTARY WORK.

1. Read an additional oration. A strong class should cover six orations in good shape.

2. After it has been translated have the pupils memorize and deliver translated selections of any oration. These may be found in many current books in the schools. If done carefully and well, this part of the work should assist in stimulating a love for Cicero's masterpieces—a most desirable result.

3. Elementayr study of the Roman constitution, especially such points as the consulate, the praetorship, the provocatio or right of appeal, the *senatus consultum ultimum*, the legal steps in the prosecution of Catiline and the theory upon which Cicero acted.

Fourth Year—

RECOMMENDED MINIMUM COURSE.

1. Study of the life and times of Vergil; the place of poetry in classic literature; archaeological and mythological incidental material.

2. Translate at least the first five books of Vergil's Aeneid. Emphasize its poetic importance. This is the high school pupil's one chance to get in touch with classic Latin poetry and he should master it as such.

3. Drill in scansion; study of the structure, and drill in the reading of dactylic hexameter verse.

SUPPLEMENTARY WORK.

1. Translation of an additional book, or more, of the Aeneid.

2. Memorizing select passages, with particular emphasis on their rhythm and poetic structure.

3. Study of English derivatives from the Latin, as in former years.

READING LIST OF SUPPLEMENTARY BOOKS IN THE STUDY OF LATIN.

Becker, Wilhelm Adolph. Gallus; or, Roman Scenes of the Time of Augustus, tr. by Frederick Metcalfe. Longmans.

Boissier, Gaston. Cicero and His Friends; a study of Roman society in the time of Caesar, tr. by A. D. Jones. Putnam.

Brooks, Edward. Story of the Aeneid. Penn.

Bulfinch, Thomas. Age of Fable; or, Beauties of Mythology. McKay.

Bulwer-Lytton. Last Days of Pompeii. Little, Brown.

Church, Alfred John. Roman Life in the Days of Cicero. Dodd, Mead.
Crawford, Francis Marion. Ave Roma Immortalis; studies from the chronicles of Rome. Macmillan.
Davis, William Stearnes. A Friend of Caesar; a tale of the fall of the Roman republic. Macmillan.
Forsyth, William. Life of Marcus Tullius Cicero. Scribner.
Fowler, William Warde. Julius Caesar and the Foundation of the Imperial System. Putnam.
Froude, James Anthony. Life of Caesar. Scribner.
Gayley, Charles Mills. Classical Myths of English Literature. Ginn.
Hill. Greek and Roman Coins.
Holmes, Thomas Rice E. Caesar's Conquest of Gaul. Macmillan.
Homerus. Iliad and Odyssey, translations by Bryant or Pope. Houghton.
Johnston, Harold Whetstone. Private Life of the Romans. Scott.
Judson, Harry Pratt. Caesar's Army; military art of the Romans. Ginn.
Lanciani. The Destruction of Ancient Rome.
Mau, August. Pompeii, Its Life and Art; tr. by F. W. Kelsey. Macmillan.
Peck, H. T. Ed. Harper's dictionary of classical literature. Harper.
Pellisson, Maurice. Roman Life in Pliny's Time; tr. by Maud Wilkinson. Jacobs.
Schuchardt, Carl. Schliemann's Excavations, an archaeological and historical study; tr. by Eugenie Sellers. Macmillan.
Sellar, William Young. Roman Poets of the Augustan Age, Vergil. 3rd ed. Clarendon.
Trollope, Anthony. Life of Cicero, two vols. Dodd.
Von Mach, Edmund. Handbook of Greek and Roman Sculpture, with prints. McClurg.
Wilkins, Augustus Samuel. Primer of Roman Literature. Macmillan.

GREEK.

General Suggestions—

1. The outline course of study provides that two years' work in Greek may be given as an optional course in the third and fourth high school years. There is so little demand for this branch of learning that it will probably be offered in only a few high schools.

2. It is also probable that only persons whose general scholastic training is of a high order will undertake to give instruction in this language. For these reasons this manual will not attempt to do anything but offer a few suggestions as to what should be aimed at in the course.

First Year—

1. The work should be based on a standard first year text in Greek. From the beginning of the course the attention of the pupil should be directed to the roots of words, to the more common prefixes, and to inflection-endings.

2. It should be borne in mind throughout the entire course that the Greek in history stands for a certain definite literary and cultural ideal. It is impossible for young pupils to master the Greek language unless they have called to their attention the place of the Greeks in the history of civilization.

3. Particular attention should be paid to neatness in writing Greek words, to the correct formation of the characters, and accuracy in the placing of accents. At the end of the first year's work the pupil should be able to form, from the word stem, or from any inflected form given him, the principal tense stem and to inflect all tenses in the various modes. He should also know the familiar use of the cases, the modes in simple sentences, the conditions in the relative clause and conditions in indirect discourse.

Second Year—

1. The work of the second year should consist of the reading of Xenophon's Anabasis. Five books should be covered; the first three to be used in prepared reading and the fourth and fifth for ready sight-reading.

2. It is indispensable that the pupil should learn through supplementary reading, histories or other sources the main facts of the narrative as a whole. For this reason the history of the period with which the Anabasis deals should be carefully reviewed at the beginning of the course.

3. Throughout the second year's work give constant attention to the study of English derivatives. The one practical use to which the pupil can put his knowledge of Greek must come through its giving him a scholarly knowledge of the origin of those words in our language which we have derived from the Greek. This is a most profitable and fascinating study.

BOOKS OF REFERENCE.

The literature in this great subject is so voluminous that it is impossible here to more than suggest a very few of the books that are useful for occasional reference. The following are suggested:

Davis. Victor of Salamis. Macmillan.
Fairbanks, Arthur. The Mythology of Greece and Rome. Appleton.
Fling, F. M. Source Book of Greek History. Heath.
Gayley. Classical Myths in English Literature. Ginn.
Greenidge. Hand Book of Greek Constitutional History. Macmillan.
Mahaffy. The Story of Alexander's Empire. Putnam.
Wheeler. Alexander the Great. Putnam.

MODERN LANGUAGES.

General Suggestions—

As contrasted with the ancient languages, the direct, immediate social value of which is slight, modern languages have a considerable social worth. Modern means of communication render every man in some degree a citizen of the world, and whatever his work in life, the average well educated person may expect at some time or other to have an opportunity to use to advantage his knowledge of a foreign tongue.

The increasing demand for the service of science and technology make a more general knowledge of foreign languages desirable. Much of the literature of exact science is written in a foreign tongue, particularly French or German. The interests of scientific investigators are common the world over, and the next best thing to their having an universal language is that they be able to read each other's communications, direct or indirect, while each should enjoy the advantage of writing in his native tongue.

In the third place the esthetic and cultural power of the study of modern languages is perhaps the most important reason for their place in the high school course of study. A study of foreign languages is also one of the best means of giving a thorough training in English grammar and the use of good English. It is impossible fully to comprehend so polyglot a language as the English without some knowledge of the sources whence it has been derived. Finally, to understand any great

literary work in a foreign language it must be read in the original. Translation always devitalizes literary productions.

It is highly desirable that the classroom used for the teaching of modern languages should be provided with a large wall map of the foreign country with the names printed in the foreign language. Such maps can be imported at a very reasonable figure. There should be as many pictures as possible representing scenes in Germany or France and various phases of foreign life. Each school should subscribe for at least one good illustrated paper from the foreign country and it should be accessible to the students in the library or in the classroom itself. The classroom should be provided further with a good German-English and English-German dictionary, Muret-Sanders, hand and school edition, or Fluegel, Schmidt, and Tanger being the best for this purpose. There should also be an all-German dictionary accessible to the students, such as Hoffman's Worterbuch, which is inexpensive. For the French, Elwall's French-English and English-French dictionary and "le Petit Larousse" are good. There should be calendars in the foreign language hung on the walls, and where possible the foreign national flag should be hung in view.

GERMAN.

General Suggestions—

1. As shown below, three years' work in German is outlined. This is one more year than is given in the outlined course of study of the State Board, but it is thought that the course as given below will be adaptable to the needs of any high school in the state.

2. The basis of the most valuable instruction in German is found in thorough drilling in vocabulary, form and syntax. The composition work should be simple and progressive.

3. The work in German conversation is of great value from a social standpoint, and should be regarded as an important auxiliary. The instructor should aim to raise this part of the course to the standard of dignified speech as soon as possible.

The most useful vocabulary which a student possesses is that which he can connect correctly in sentences, for only through sentences can he get the proper understanding and use of words. For this, more or less conversation is essential and it cannot be replaced by any other method. It has been demonstrated time and again, both in this county and abroad, that the students who learn conversation from the very beginning of their study of modern language are the best equipped in that language. Familiarity with the idioms of a modern foreign language can come only through learning those idioms and using them daily. Such work is vitally important and is the best method of teaching, for it teaches the student to *think* in the language and helps more than anything else to develop what the Germans call "Sprachgefuhl." A student should begin with a few simple phrases and sentences in his first few days of study of the new language. It is most natural and easy to do and robs the language of many of its terrors from the first. That which he learns must be that which he can most naturally and frequently use. He therefore should begin with such phrases as "Good morning; how are you?" "Thank you," etc. He must learn the little polite expressions of everyday life. The conversation must be wisely used and not taught to the neglect of form and syntax, but rather as the effective means of fixing grammatical principles. It must at the same time be natural and of such a character as to give the student a readiness and ease in the common expressions of daily life. In this way a vast amount of time is gained and the student works with a zest and enthusiasm because the language is real to him and he can use it to express himself.

First Year German—

RECOMMENDED MINIMUM COURSE.

1. This work should be based on any good text-book in elementary German, of which from 150 to 200 pages ordinarily should be covered in the first year with careful attention to the following points:

(a) Drill in pronunciation. (b) Memorization and frequent

repetition of easy colloquial sentences. (c) Drill on the rudiments of grammar, including inflected articles, the noun, the adjective and pronouns of everyday speech, and the more common weak and strong verbs. (d) Many easy exercises to familiarize the pupil with the forms and principles of grammar and to develop readiness of expression. (e) The acquisition of a working vocabulary.

2. The reading of from 75 to 100 pages selected from any of the following books:

Aus meinem Lande.

Willkommen in Deutschland.

Im Vaterland.

Anderson. Bilderbuch ohne Bilder.

Biblische Geschichten.

Campe. Robinson der Jungere.

Frommel. Eingeschneit mit Ranzel und Wanderstab.

Geschieten und Marchen fur Aufanger.

Grimm. Kinder und Hausmaerchen, viz.: Rotkappchen, Dornroslein, Schneewittchen, Hansel and Gretel, Aschenputtel.

Huss. German Reader for Beginners.

Muller and Wenckebach. Gluck Auf.

Marchen und Erzahlungen, Vol. I.

3. The memorizing of three of the following poems:

Die Lorelei.

Heidenroslein.

Du Bist wie eine Blume.

Das zerbrochene Ringlein, or others of similar length and character.

4. Drill in easy German conversation.

5. Practice in writing German script.

SUPPLEMENTARY COURSE.

1. Practice in writing additional easy German compositions, using the German script.

2. The reading of additional texts, either selected from the list given or from others which may be preferred by the instructor.

3. The memorization of short, easy prose selections as a basis for conversation.

Second Year German—

RECOMMENDED MINIMUM COURSE.

1. The translation of from 150 to 200 pages of easy German stories, poems and plays. Short selections from many sources are preferable to fewer longer ones read in their entirety.

2. Regular drills in German grammar. Also, at least one period per week should be given to work in German composition, based on the regular text.

3. Conversation and reproduction of German colloquies, songs and proverbs. Dictation on topics adapted to conversation. In large classes, drill in repetition of German phrases and selections in chorus.

4. The reading of German papers for practice and sight-reading. Every teacher of German should attempt to procure some current German newspaper for use in class. Pupils should be advised, if not required, to read these aloud in studying them. This practice should be urged in all foreign language study. As an alternate the use of the little periodical "Aus Nah und Fern," published at 330 Webster Ave., Chicago, of which four numbers are issued annually, the annual subscription price being 40 cents, is suggested.

5. The memorizing of poems. The following are suggested: Erlkonig, Die Wacht am Rhein, Die Grenadiere.

The following texts are suitable for reading: Nein, Er ist nicht eifersuechtig, Das Peterle von Nurnberg.

Arnold. Fritz auf Ferien.

Baumbach. Im Zwielicht. Waldnovellan.

Ebner-Eschenbach. Krambambuli.

Gerstacker. Germelshausen.

Hauff. Das Kalte Herz. Die Karawane.

Hillern. Hoher als die Kirche.

Leander. Kleine Geschichten. Traumereien.

Messiner. Aus deutschen Landen.

Moser and Heiden. Kopnickerstrasse 120.

Muller. Im Wartesslon erster Klasse.

Schiller. Wilhelm Tell.

Seidel. Der Lindenbaum. Die Monate. Herr Omnis. Leberecht Huhnchen.

Storm. Geschichten aus der Tonne. St. Jurgen. Immensee.

Wildenbruch. Das edle Blut. Der Letzte.

Wilhelmi. Einer muss Heiraten.

Zschokke. Der zerbrochene Krug. Das Abenteuer der Neujahrsnacht.

SUPPLEMENTARY COURSE.

1. Drill in the more intricate forms of German grammar.
2. Additional work in composition.
3. The reading of additional literature and any other drill that may be suggested by the instructor.

Third Year German—

The instructor in German should fully appreciate that when he has studied German for three years in the high school, the pupil should be able readily to read at sight ordinary German prose or poetry; to put into German a connected passage of simple English; to write an idiomatic German letter, and to recognize all ordinary grammatical constructions. He should be able to translate and explain fully any passage taken from some text not more difficult than those recommended for reading during the year.

RECOMMENDED MINIMUM COURSE.

1. Continued practice in paraphrases, abstracts and reproductions.

2. Regular drill on the less common strong verbs and the use of articles, cases, auxiliaries, tenses and modes.

3. Practice drill in the arrangement of word order, the formation of words and cognates.

4. The use of a good text on German composition.

5. At least 350 pages of moderately difficult prose and poetry should be well read. The following are recommended as texts for reading:

Der Geissbub von Engelberg.

Baumbach. Der Schweigersohn. Der Fluch der Schonheit.

Chamisso. Peter Schlemihl.

Ebner-Eschnerbach. Lotti. Die Uhrmacherin.

Frenssen. Jorn Uhl (selections).

Freytag. Die Journalisten. Soll und Haben.

Goethe. Hermann und Dorothea. Dichtung und Wahrheit (selections).

Hauff. Lichtenstein.

Heine. Die Harzreise.

Hoffman. Meister Martin, der Kufner.

Lessing. Minna von Barnhelm (should be required).

Lillienkron. Anno 1870.

Ludwig. Zwischen Himmel und Erde.

Moltke. Die beiden Freunde.

Morike. Mozart auf der Reise nach Prag.

Moser. Der Bibliothekar.

Riehl. Das Spielmannskind. Der Fluch der Schonheit. Der Stumme Ratsherr.

Scheffel. Der Trompeter von Sakkingen.

Schiller. Die Jungfrau von Orleans. Wilhelm Tell (if not read during the second year).

Storm. Pole Poppenspaler.

SUPPLEMENTARY COURSE.

1. Sight reading and discussion from German papers and magazines.
2. If possible have some German, who lives in the neighborhood, come in and give the class occasional talks in his own language. This will greatly assist them in getting the accent.
3. The formation of a German club among the pupils is recommended. German residents of the community may become members to an advantage.
4. Short one-act plays in German may be given.

FRENCH.

General Suggestions—

1. The fact that French is the leading romance language of the modern world should be emphasized. Its place in the literature of art, and its capacity for reflecting the artistic temperament of the French people must not be forgotten.

2. Every good means of developing an accurate French pronunciation should be used. The creation of an atmosphere that is French is of the highest importance in giving pupils an appreciation of what the French language really is.

First Year—

RECOMMENDED MINIMUM COURSE.

1. Regular work from a standard French grammar, in the hands of each pupil.

2. The mastery of some good standard text in first year French.

The following suggestions are offered:

(a) Drill in reading should be begun early in the course.

(b) The verbs, phrases and idioms of everyday French should be committed to memory early.

(c) Learn to write simple letters or other forms of composition.

3. Commit to memory a few simple French poems. The following is a list of books suitable for reading and study:

About. Petites histoires.

Bruno. Le tour de la France.

Bedolliere. La mere Michel et son chat.

Chateaubriand. Les aventures du dernier Abencerage.

Daudet. Le petit chose.

Erckmann-Chatrian. Madame Therese. Waterloo. Le Conscrit de 1813, etc.

Foa. Contes biographiques, Le petit Robinson de Paris.

Foncin. Le pays de France.

Labiche & Martin. La poudre aux yeux, Le voyage de M. Perrichon.

Legouve & Labiche. La cigale chez les fourmis.

Malot. Sans famille.

Mairet. La clef d'or. L'enfant de la lune.

Mairet. La tache du petit Pierre.

Meilhac & Halevy. L'ete de la Saint Martin.

Merimee. Colomba.

Nodier. Le chien de Brisquet, etc.

Sand. La mare au diable.

Schultz. La Neuvaine de Colette.

Verne. (Selected stories).

SUPPLEMENTARY COURSE.

1. Have each pupil draw a map of France, indicating either the thirty-three provinces as they existed before the revolution, or the modern departments. Write the names of all principal places and geographical features in French.

2. Make a study of Paris—its life, arrangement, main features of interest.

3. Learn the story of the writing of La Marseillaise, and commit the song to memory. Singing this song frequently is a splendid exercise.

Second Year—

RECOMMENDED MINIMUM COURSE.

1. During the first part of the year, a story of considerable length should be read. Either of the following is suggested:

Maupassant. Contes Choisis.

Augier & Sandeau. Le gendre de M. Poirier.

Brete. Mon oncle et mon cure.

Laurie. Memoires d'un collegien.

Labiche. La grammaire.

About. La mere de la marquise.

Beranger. (Selected poems).

Coppee. (Selected poems).

Daudet. La Belle-Nivernaise, Tartarin de Tarascon.

Dumas. La tulipe noire, Monte Cristo, Les trois mousquetaires.

Hugo. La Chute.

Loti. Pecheur d'Islande.

Michelet. Extracts.

Sandeau. Mademoiselle de la Seigliere.

Scribe. Le Verre d'Eau.

Mme. de Sevigne. (Selected letters).

Vigny. La canne de jonc.

2. Drill in irregular verbs, the peculiar uses of any words and idioms. The notebook should be constantly used in this work.

3. The latter part of the year should be devoted almost entirely to reading, the aim being to read rapidly and translate into good English.

4. Have each pupil read a short French story outside of class, and hand in a criticism, 250-300 words in length, written in French.

SUPPLEMENTARY WORK.

1. Reading additional stories.

2. Commit to memory—Carcassonne; part or all of La Nuit de Decembre; part of Jeanne d'Arc.

3. Study about the Sorbonne, the French Academy, the French Revolution, and authors read in class.

4. An excellent exercise is the exchange of letters with pupils of French schools. This may be initiated very easily, and prove a great source of profit and interest. Every high school offering the work in French should subscribe for some standard French periodical for the use of pupils.

HISTORY, CIVICS AND ECONOMICS.

The work in these branches as outlined by the State Board includes the following:

1. Ancient history, to 800 A. D., one year; and Medieval and Modern European history, one year; or, General history, including the leading features of the two foregoing, one year; or, a year's work divided between Ancient history and English history.

2. English history, one year.

3. United States History and Civics, one year.

4. Economics, one-half year.

General Suggestions—

1. The principal object of all instruction in this great branch of human learning should be to encourage the study of the subject for its own sake, and not alone in order that the pupils may pass examinations. Emphasis must be laid on the value of persistent, thorough effort; on revealing those broad historical relations that can hardly be developed by devoting the attention to a single text-book; on stimulating a desire for wide and discriminate reading.

2. Visual aids should be employed to bring historical truths home to the minds of pupils, especially those in the first two years of the course. These include illustrations, plans, maps, cartoons. photographs, copies of original manuscripts—in short, anything that will assist the pupil in getting a picture of an event in his mind. He should be encouraged to picture himself as in the midst of the scene of events about which he is studying.

3. The history work should be constantly correlated with the geography of the particular country, campaign or movement under consideration at any given time. History cannot otherwise be understood. Map-drawing should be a part of every course in history. This may be done with outline maps. Many excellent ones are available. A good map of the country whose history they are studying should be continually before the class.

4. The social and economic phases of history should be constantly emphasized. The instructor should lead the pupils to see in how great a degree historical movements have been the result of attempts on the part of men to fulfill economic wants, and to obey social impulses. One of the most profitable results that can come to a pupil from the study of history is some insight into the operation of these great human forces.

5. Emphasis should be laid on the chronological order and sequence of events. Many of the great events in history are important because they followed or preceded other human movements. *To this end a few leading dates should be absolutely*

fixed in mind, to become centers around which to cluster the events in the history of a period, or a nation.

6. Human interest should be made prominent. The people of history were real flesh and blood people like the rest of us, who made trouble or got out of it, took advantage of one another, enjoyed pleasure or suffered pain, for the thousand and one reasons for which we go through the same experiences today. Only when young people sense the warm heart of humanity pulsating in the body of human history are they attracted to the subject. This is after all the key to the problem of how to make the study of history interesting. The dead bones must be clothed anew with flesh and blood, and made to move and talk again.

ANCIENT HISTORY.

First Semester—

RECOMMENDED MINIMUM COURSE.

1. Ancient Oriental peoples—Egyptian, Mesopotamian, Syrian, Hebrew, Mede and Persian.
2. Early development of Greece, earliest times to 750 B. C.
3. The development, through the city-state, of the Greek nation, to the period of foreign wars, 750-500 B. C.
4. Period of foreign wars and Greek supremacy, to about 479 B. C.
5. Period of Athenian growth and supremacy to 431 B. C.
6. Period of internal strife; the rise of Macedon.
7. The rise and fall of the empire of Alexander.
8. Throughout the course make outline maps, showing (a) the location of the ancient peoples, with boundaries and main lines of communication, (b) the Grecian peninsula and Aegean sea, (c) the empire of Alexander.
9. Regular notebook work on assigned topics.

SUPPLEMENTARY COURSE.

1. Detailed investigation of special topics, such as the Homeric question, the city-state as a feature of civic development, etc.

2. The memorization of selected passages from translations of Demosthenes' orations, the Iliad and Odyssey, etc.

3. Additional maps.

4. Frequent drill in review to fix in mind a few leading dates in their order and connect them with historical events.

Second Semester—

RECOMMENDED MINIMUM COURSE.

1. Early Rome; myths and legends; the growth of Roman supremacy in Italy, to 260 B. C.

2. The conquest of the Mediterranean world to 133 B. C.

3. The ancient world under Roman dominion, to 31 B. C.

4. The Roman Empire, to 375 A. D.

5. The change from Roman to Germanic Europe; the barbarian migrations; rise of the Franks, to 800 A. D.

6. Outline maps—at least three representative maps should be made.

7. Notebook work on assigned readings.

SUPPLEMENTARY COURSE.

Follow in Roman history, the same lines as suggested for the first semester in Greek history. Selections from Cicero, Vergil and Horace may be memorized.

REFERENCE BOOKS IN ANCIENT HISTORY.

For the following list of books on this subject, than which it would be difficult to find one better suited to the needs of the high school, we are indebted to the list of books published by the Oregon Library Commission, 1907:

Abbott, Evelyn. History of Greece. 3 vols. Putnam.

Abbott, Evelyn. Pericles and the golden age of Athens. Putnam.

Abbott, F. F. History and description of Roman political institutions. Ginn.

Botsford, G. W. Ancient History for beginners. Macmillan.

Botsford, G. W. History of Rome for high schools and academies. Macmillan.

Botsford, G. W. History of the Orient and Greece. Macmillan.

Botsford & Botsford, L. S. Story of Rome as Greeks and Romans tell it. Macmillan.

Bury, J. B. History of Greece to the death of Alexander the Great. Macmillan.

Church, A. J. Roman Life in the days of Cicero. Macmillan.

Church, A. J. Stories of the East, from Herodotus. Dodd.

Davidson, J. L. Strachan. Cicero and the fall of the Roman Republic. Putnam.
Day, Edward. The social life of the Hebrews. Scribner.
Dill, Samuel. Roman society in the last century of the western empire. Macmillan.
Firth, J. B. Augustus Caesar. Putnam.
Fling, F. M. Sourcebook of Greek history. Heath.
Fowler, W. W. The city-state of the Greeks and Romans. Macmillan.
Fowler, W. W. Julius Caesar and the foundation of the Roman imperial system. Putnam.
Gibbon, Edward. Decline and fall of the Roman empire. American Book Company.
Goodspeed, G. S. A history of the ancient world. Scribner.
Goodspeed, G. S. History of the Babylonians and Assyrians. Scribner.
Gow, James. A companion to school classics. Macmillan.
Greenidge, A. H. J. A handbook of Greek constitutional history. Macmillan.
Gulick, C. B. Life of the ancient Greeks, with special reference to Athens. Appleton.
Harper's dictionary of classical literature and antiquities; ed. by H. T. Peck. American Book Company.
Hoernes, Moriz. Primitive Man. Macmillan.
How & Leigh. History of Rome. Longmans.
Inge, W. R. Society in Rome under the Caesars. Scribner.
Johnston, H. W. Private life of the Romans. Scott.
Lord, J. K. Atlas of the geography and history of the ancient world. Sanborn.
Mahaffy, J. P. Old Greek life. American Book Company.
Mahaffy, J. P. The story of Alexander's empire. Putnam.
Maspero, G. C. C. Life in ancient Egypt and Assyria. Appleton.
Morris, W. O. Hannibal, Soldier, Statesman, Patriot; and the crisis of the struggle between Carthage and Rome. Putnam.
Munro, D. C. Source-book of Roman history. Heath.
Pelham, H. F. Outlines of Roman history. Putnam.
Plutarch. Lives, 2 vols. Burt.
Seignobos, Charles. History of ancient civilization; translated and edited by A. H. Wilde. Scribner.
Shuckburgh, E. S. Short history of the Greeks. Cambridge.
Tozer, H. F. Classical geography. American Book Company.
Wendel, F. C. H. History of Egypt. American Book Company.
West, W. M. Ancient history to the death of Charlemagne. Allyn.
Wheeler, B. I. Alexander the Great. Putnam.
Wolfson, A. M. Essentials in ancient history; from the earliest records to Charlemagne. American Book Company.

MEDIEVAL AND MODERN HISTORY.

In a year's work in medieval and modern history two purposes must be kept continuously in mind; first, to lay a basis for putting the pupils in close touch with the leading phases of modern economic and political conditions; and second, to show how great is the heritage of the history of civilization.

First Semester—

RECOMMENDED MINIMUM COURSE.

1. Trace the life and movements of the Germanic tribes, showing how, on the remains of the Roman empire were laid the foundations for the modern states of Germany, Italy, France and Spain.

2. Trace the growth of the papacy; show the influence of the church in preserving the materials of civilization.

3. The development of France, England and Germany.

4. The crusades, the renaissance and the Protestant Revolt.

5. At least three good outline maps should be made, showing the development of Europe. The following are suggested:

(a) One showing Europe about 800 A. D., indicating the movements of the Germanic tribes.

(b) One showing Europe as divided by the treaty of Verdun, or at the accession of Otto the Great, 962.

(c) One showing Europe at the beginning or end of the Hundred Years' War. The two stages may be shown on one map, with the aid of some colored crayon.

6. Notebook work and reference reading, covering at least 250 pages of material to be read outside the class.

SUPPLEMENTARY COURSE.

1. The study of translated selections from the original sources.
2. Debates in class on some of the great questions of history.
3. Complete papers on assigned topics.
4. Additional map work.

Second Semester—

RECOMMENDED MINIMUM COURSE.

1. The Reformation.
2. England under Puritan and Royalist.
3. The ascendancy of France under Louis XIV.
4. The development and unification of Germany and Italy; the rise of Russia and Prussia.
5. The French Revolution and its effects.
6. Europe since the Congress of Vienna.
7. The development of constitutional governments.
8. At least three maps showing Europe at representative periods.
9. Note-book work, as for the first semester.

SUPPLEMENTARY COURSE.

Follow the same lines as suggested for the first semester. Especial emphasis should be laid on the rise of modern economic and political problems. There is abundant opportunity to make this phase of the study of history intensely practical.

LIST OF REFERENCE BOOKS ON MEDIEVAL AND MODERN EUROPEAN HISTORY.

Adams, G. B. Civilization during the middle ages. Scribner.
Adams, G. B. European history. Macmillan.
Adams, G. B. Growth of the French nation. Macmillan.
Andrews, C. M. Historical development of modern Europe. Putnam.
Archer & Kingford. The crusades. Putnam.
Bryce, James. Holy Roman empire. Macmillan.
Cunningham, William. An essay on western civilization in its economic aspects; medieval and modern times. Cambridge.
Davis, H. W. C. Charlemagne. American Book Company.
Eginhard. Life of Charlemagne. American Book Company.
Emerton, Ephraim. Introduction to the study of the middle ages. Ginn.
Emerton, Ephraim. Medieval Europe. Ginn.
Fisher, G. P. Outlines of Universal history. American Book Company.
Fournier, August. Napoleon the First; edited by E. G. Bourne. Holt.
Froissart, Sir John. The boy's Froissart. Scribner.
Fyffe, C. A. History of modern Europe. Holt.
Gardiner, Mrs. B. M. C. French Revolution. Longmans.
Guerber, H. A. Legends of the middle ages. American Book Co.
Harding, S. B. Essentials in medieval and modern history. American Book Company.

Hassall, Arthur. The French people. Appleton.
Haydn, J. T. Dictionary of dates and universal information relating to all ages and nations, containing the history of the world to the end of 1903. Putnam.
Headlam, J. W. Bismarck and the foundation of the German empire. Putnam.
Henderson, E. F. Short history of Germany. Macmillan.
Hume, M. A. S. Modern Spain, 1788-1898. Putnam.
Hume, M. A. S. Spain, its greatness and decay. 1479-1788. Putnam.
Irving, Washington. Chronicle of the conquest of Granada. Putnam.
Johnson, A. H. Normans in Europe. Longmans.
Labberton, R. H. Historical atlas, 3800 B. C. to 1900 A. D. Silver.
Larned, J. N. History for ready reference. Nichols.
Lodge, Richard. Close of the middle ages, 1273-1494. Macmillan.
Longman, F. W. Frederick the Great and the seven years' war. Longman.
Lowell, E J. Eve of the French revolution. Houghton.
Mohammed. Speeches and table talk of Mohammed; edited by Stanley Lane-Poole. Macmillan.
Motley, J. L. Peter the Great. Maynard.
Motley, J. L. Rise of the Dutch republic. Crowell.
Munro, D. C. History of the middle ages. Appleton.
Oman, C. W. C. The dark ages. Macmillan.
Orsi, Pietro. Modern Italy, 1748-1898. Putnam.
Ploetz, Carl. Epitome of ancient, medieval and modern history. Houghton.
Lane-Poole, Stanley. Moors in Spain. Putnam.
Lane-Poole, Stanley. Saladin and the fall of the kingdom of Jerusalem. Putnam.
Putzger, F. W. Historischer schul-atlas zur alten, mittleren und neuen geschichte. Revised edition. Lemcke.
Robinson, J. H. Introduction to the history of western Europe. Ginn.
Robinson, J. H. Readings in European history. Ginn.
Rose, J. H. Revolutionary and Napoleonic era, 1789-1815. Cambridge.
Sedgwick, H. D., Jr. Short History of Italy. Houghton.
Seebohm, Frederic. The era of the Protestant revolution. Longmans.
Symonds, J. A. Short history of the renaissance in Italy. Holt.
Thatcher & McNeal. A source-book for medieval history. Scribner.

GENERAL HISTORY.

Outline for a Year's Work in Schools in Which Only One Year's Work Can Be Offered in Addition to That in United States History and Civics.

In many high schools only one year's work in history in addition to that in United States history and civics can be offered. In such cases, just what history should be given during that year is a question not easily answered.

Some teachers of history hold that it is a serious mistake to outline a course in "general history" as usually given. In fact, the trend of history teaching in many high schools has been strongly away from offering such a course. The reasons for this position have been given at length in the "Report of the Committee of Seven on History Teaching in the Schools" (Macmillan, 1899) which says:

"We do not recommend a short course in general history because such a course necessitates one of two modes of treatment, neither of which is sound and reasonable. By one method, energy is devoted to the dreary, and perhaps profitless task of memorizing facts, dates, names of kings and queens, and the rise and fall of dynasties. There is no opportunity to see how facts arose or what they effected, or to study the material properly, or to see the events in simpler form as one followed upon another, or to become acquainted with the historical method of handling definite concrete facts and drawing inferences from them. By the second method, pupils are led to deal with large and general ideas which are often quite beyond their comprehension, ideas which are general inferences drawn by the learned historian from a well-stored treasure-house of definite data. They are taught to accept unquestioningly broad generalizations, the foundations of which they cannot possibly examine—as they must do if they are to know how the historical student builds his inferences, or how one gains knowledge of the general truths of history."

The same report elsewhere emphasizes the point that work in history properly should give the pupils power, in dealing with historical material; that courses in "general history" have the effect of giving the student only a moderate amount of information, and that apt to be misleading, with a development of power to only a very slight degree.

For the foregoing reasons, the author of this manual has been urged by some leading history teachers in this state to omit the outline of a course in general history from the manual.

Other teachers of history, of equally recognized standing in high school circles, have urged the value of the general history course. They endorse the study of the old civilizations on the ground that these represent the childhood of the race; that the subject is easily comprehendable by the younger high school pupils if taught correctly; that "a sweep of the centuries from the time man's influence began on the earth to the time of his great awakening serves to show the high school pupil something of our origin, subdues confusing details and throws into relief the principles that have meant the making or destruction of a principle or a nation. It forms a fitting introduction to the more complex civilizations which are to follow, namely, those of modern history."

Undoubtedly there is much merit in both arguments. Whatever the test of time will determine as the best procedure, the fact remains that in many small high schools, one year's work in history in addition to that in United States history and civics, will be taught. Such a piece of work should not ordinarily be attempted by pupils below the tenth grade. In order to meet the situation, the two following courses are outlined. The State Department of Education recommends the second course for the reason that it gives an opportunity for a brief study of the beginnings of civilization, and of the history of the two nations to which modern civilization owes so much, namely, Greece and Rome, and follows this by a course in the history of the English people, through whom the people of the United States derive their institutions.

I. General (Ancient, Medieval and Modern European History).

RECOMMENDED MINIMUM COURSE.

1. Ancient History. In this part of the work, to which not over ten weeks should be given, the effort should be devoted to establish the following points:

(a) *The fact of the existence*, in remote antiquity, of highly developed civilizations in the Nile Valley, Asia Minor and the Mesopotamian lands.

(b) The rise of Greece, and what the Greeks stand for in the history of civilization, viz:

I. The Greek love of liberty.

II. The Greek type of state.

III. The Greek idea of culture.

(c) The growth of Rome, with emphasis on Rome's contributions to civilization, in the way of law, language, organized government, and military tactics.

2. Medieval History from about 800 to 1750 A. D. About twelve weeks. Bring out the following points:

(a) The beginning of modern European states; attempts to re-establish a Roman empire.

(b) The place of the Christian church in history.

(c) The rise of the Anglo-Saxon race, and the mingling of Germanic culture with the classical heritage of antiquity.

(d) The Protestant revolt and the reformation.

(e) The growth of representative government in England; Magna Charta; the Petition of Right; The Bill of Rights.

3. Modern History. This will easily take the remainder of the year. The following main points are suggestive:

(a) The theory and practice of the Balance of Power among European states.

(b) The French Revolution; The Napoleonic Era; and the work of the Congress of Vienna.

(c) The industrial revolution, and economic history of modern European states.

(d) The revolutionary movements of 1840-1850 and their effects.

(e) England during the last half of the 19th century.

4. At least six representative maps should be drawn during the year.

5. Reference reading from standard secondary sources.

SUPPLEMENTARY COURSE.

Perhaps the best supplementary work in a course of this kind is a systematic study of the lives, work and influence on history, of the leading individual characters. The object should be to group movements and leading facts around central figures. Such characters as Alexander, Aristotle, Caesar, Charlemagne, Innocent III, Alfred, Savonarola, Luther, Frederick, and many others make appropriate centers.

REFERENCE BOOKS.

See lists under this heading on pages ——.

II. Ancient History Combined with English History.

RECOMMENDED MINIMUM COURSE.

1. Ancient History. In this part of the work, to which not over ten weeks should be given, the effort should be devoted to establish the following points:

(a) *The fact of the existence*, in remote antiquity, of highly developed civilizations in the Nile Valley, Asia Minor and the Mesopotamian lands.

(b) The rise of Greece, and what the Greeks stand for in the history of civilization, viz:

I. The Greek love of liberty.

II. The Greek type of state.

III. The Greek idea of culture.

(c) The growth of Rome, with emphasis on Rome's contributions to civilization, in the way of law, language, organized government, and military tactics.

2. English History. In this part of the work, to which twenty-six or twenty-seven weeks may be devoted, the following subdivisions may form a working outline:

I. English history from the Roman Invasion to the Norman Conquest. This part of the work may be gone over briefly, the principal effort being to show the influence of Roman civilization on early Britain, and the origin of Anglo-Saxon institutions.

II. The Norman kings and institutions, with particular emphasis on the influence of Norman-French law, language and religious life.

III. The Plantagenets; the struggle for continental power; the divided house; 1154-1445.

IV. England under the Tudors; the rise of a despotic kingship.

V. The Stewarts, the Puritans and the development of the constitutional kingdom; 1603-1820.

VI. The British Empire from 1820 to the present time, with especial emphasis on the growth of peaceful relations between England and the United States.

SUPPLEMENTARY COURSE.

1. A study of historic movements, showing relation between England and the continent, such as: The Reformation; The Theory of the Balance of Power; the French Revolution, etc.

2. The achievements of representative Englishmen in the various fields of human endeavor.

ENGLISH HISTORY.

General Suggestions—

A year's work in English history is offered, which may profitably be taken in addition to the study of Ancient, Medieval and Modern European history, especially by pupils who have a particular fondness for the subject of history in general, or the course in English history may take the place of that in Medieval and Modern history. The argument in favor of this latter plan is that the history of England reflects and brings out the history of continental European countries. It is further argued that we, as English-speaking people, derive our inheritance from classic times through Anglo-Saxon channels, and find the immediate source of our national institutions in those of England.

A second alternative would be to give a year's course in English history instead of any other, if only a year of historical work in addition to that in United States history and

civics is offered. If this course is followed, the connection of English history with that of other European countries, including Rome, should be emphasized, and a good deal of supplementary work done in European history, both ancient and modern. *Some conception of the beginnings of things is indispensable to a satisfactory knowledge of history.*

No attempt will be made, in the following outline, to divide the work into semesters.

RECOMMENDED MINIMUM COURSE.

1. Early Briton, to the coming of the Saxons, about 450 A. D.
2. Saxon England, 450-1066.
3. The Norman kings and institutions, 1066-1154.
4. The Plantagenets; the struggle for continental power; the divided house, 1154-1485.
5. England under the Tudors, 1485-1603.
6. The Stuarts; the Puritan uprising and regime; the Royalist reaction, 1603-1688.
7. The development of a constitutional kingdom, 1688-1830.
8. The British Empire, 1820 to the present time.
9. Reference reading, chiefly on the relations between England and other countries, especially the United States.
10. The drawing of at least six outline maps. These should be so planned as to show the progress of international, or world movements.

SUPPLEMENTARY COURSE.

1. Study of the sources of English history.
2. The achievements of noted Englishmen in literature, science and government.
3. Readings in representative literature.

LIST OF REFERENCE BOOKS ON ENGLISH HISTORY.

Andrews, C. M. History of England. Allyn.
Bateson, Mary. Medieval England. Putnam.
Beard, C. A. An introduction to the English historians. Macmillan.
Besant, Sir Walter. Story of King Alfred. Appleton.
Bolton, Mrs. S. K. Famous English statesmen of Queen Victoria's reign. Crowell.
Bryce, James. William Ewart Gladstone. Century.

Cheyney, E. P. An introduction to the industrial and social history of England. Macmillan.
Cheyney, E. P. A short history of England. Ginn.
Colby, C. W. Selections from the sources of English history. Longmans.
Firth, C. H. Oliver Cromwell and the rule of the Puritans in England. Putnam.
Freeman, E. A. Short history of the Norman conquest of England. Clarendon.
Freeman, E. A. William the Conqueror. Macmillan.
Froude, J. A. English seamen in the sixteenth century. Scribner.
Gardiner, S. R. Atlas of English history. Longmans.
Gardiner, S. R. First two Stuarts and the Puritan revolution, 1603-60. Longmans.
Gardiner, S. R. Student's history of England from the earliest times to 1885. Longmans.
Green, J. R. Short history of the English people. American Book Co.
Green, W. D. William Pitt, Earl of Chatham, and the growth and division of the British empire. Putnam.
Harrison, Frederic. Oliver Cromwell. Macmillan.
Hooper, George. Wellington. Macmillan.
Johnston & Spencer. Ireland's story. Houghton.
Kendall, E. K. Source-book of English history. Macmillan.
Larned, J. M. History of England. Houghton.
McCarthy, Justin. British political portraits. Macmillan.
McCarthy, Justin. Epoch or reform, 1830-1850. Longmans.
McCarthy, Justin. Story of the people in England in the nineteenth century. 2 vols. Putnam.
Moberly, C. E. The early Tudors. Longmans.
Morley, John. Walpole. Macmillan.
Oman, C. W. C. England in the nineteenth century. Longmans.
Plummer, Charles. The life and times of Alfred the Great. Clarendon.
Reich, Emil. New student's atlas of English history. Macmillan.
Rose, J. H. The rise and growth of democracy in England. Duffield.
Seeley, Sir J. R. Expansion of England. Little.
Stubbs, William. The early Plantagenets. Longmans.
Synge, M. B. A short story of social life in England. Barnes.
Traill, H. D. William III. Macmillan.
Walker, A. P. Essentials in English history. American Book Co.
Woodward, W. H. Short history of the expansion of the British empire. Cambridge.
Wrong, G. M. The British Nation. Appleton.

AMERICAN HISTORY AND CIVICS.

General Suggestions—

1. A year's work in this branch is required in all courses outlined by the State Board, except the commercial course, in which it is optional. It is thus practically required of all pupils for the completion of a full high school course, and should not be offered, unless in very exceptional cases, to pupils in any other than the twelfth grade.

2. The point of view in teaching the course should be entirely different from that of the elementary school. The pupil has now nearly or quite reached the age of citizenship. He is not merely to learn to recite about things that have happened in United States history. He must be brought to seek out and grasp underlying causes, and the trend of great movements, in order that on entering into his civic heritage he may appreciate its worth, and understand his social obligation to his own day and generation.

3. Two general plans are variously followed in giving the course in history and civics; one is to cover the history first and then devote to civics the balance of the year; the other is to carry the two branches side by side throughout the year, bringing out the various civic and constitutional steps in their proper place in history. It is left to the wisdom of the instructor to determine which of these plans may be followed. If the first plan, that of carrying each branch separately is followed, it will be necessary to devote about three-fifths of the time to the history and the remaining two-fifths of the year to the civics.

RECOMMENDED MINIMUM COURSE.

1. The period of colonization, discovery and struggle, 1492-1783. This part of the work should be treated entirely as a review.

2. The period extending from 1783-1865 should be studied with a view to emphasizing the growth of nationality, the west-

ward movement, and the rise of those forces whose operation brought about the Civil war.

3. The period from 1865 to the present time is the one of the greatest importance to our high school pupils. Aim to get the class into this period as soon as is consistent with any reasonable degree of thoroughness.

4. Study the rise and growth of modern institutions, such as the tariff, the national banking system, the railroad systems, the Interstate Commerce Commission, our national system of universal, free education, the civil service, the United States Department of Agriculture, etc. Teach the pupils to use other sources than the text-book.

5. The study of present-day economic, social, and political problems, such as municipal government, modern sanitation for cities, the food supply, waterways, conservation of national resources, etc. Through this part of the work they should become intelligent readers of current literature.

SUPPLEMENTARY COURSE.

1. Have pupils study on assignment various movements in American history, such as the Slave Power; State Expansion; The Monroe Doctrine, etc., etc.

2. Further readings from source material. There is practically no limit to this kind of work, and it is vital.

CIVICS.

RECOMMENDED MINIMUM COURSE.

1. Features of local government, including school district, town and county.

2. The government of the state, including the constitution, the state activities and the instruments of government.

3. The federal government; organization, relations with the people, powers, and comparison with the government of other countries.

SUPPLEMENTARY COURSE.

1. Study all such documents as the Articles of Confederation; also other documents illustrative of various movements in United States history.

2. The study of writs, blanks, forms used in various civic activities, etc. These may be obtained from the county seat, or from some

local attorney or notary. The analysis of the provisions contained in the blank to be filled out by an alien applying for papers of naturalization, for instance, can be made a most profitable class exercise.

3. Careful study of some critical event in history, such as the Webster-Hayne debate, some international treaty, with emphasis on the relations illustrated.

LIST OF REFERENCE BOOKS IN AMERICAN HISTORY.

Brady, C. T. Border fights and fighters. McClure.
Brigham, A. P. Geographic influences in American history. Ginn.
Burgess, J. W. The civil war and the constitution. 2 vols. Scribner.
Burgess, J. W. The middle period. Scribner.
Burgess, J. W. Reconstruction and the constitution. Scribner.
Cambridge. Modern history. Macmillan.
Channing, Edward. History of the United States. Macmillan.
Channing and Hart. Guide to the study of American history. Ginn.
Coman, Katherine. Industrial history of the United States. Macmillan.
Dodge, T. A. Birdseye view of our civil war. Houghton.
Earle, Mrs. A. M. Home life in colonial days. Grosset.
Eggleston, G. C. A rebel's recollections. Putnam.
Elson, H. W. History of the United States. Macmillan.
Fisher, G. P. The colonial era. Scribner.
Fiske, John. The American revolution. 2 vols. Houghton.
Fiske, John. Beginning of New England. Houghton.
Fiske, John. Critical period of American history. Houghton.
Fiske, John. Discovery of America. 2 vols. Houghton.
Fiske, John. Dutch and Quaker colonies in America.
Fiske, John. New France and New England. Houghton.
Fiske, John. Old Virginia and her neighbors. 2 vols. Houghton.
Gordon, J. B. Reminiscences of the civil war. Scribner.
Gordy, J. P. Political history of the United States. Holt.
Hart, A. B. Essentials in American history. American Book Company.
Hart, A. B. Formation of the union. Longmans.
Hart, A. B. American history told by contemporaries. 4 vols. Macmillan.
Cheyney, E. P. European background of American history (American Nation series). Harper.
Bourne, E. G. Spain in America (American Nation series). Harper.
Howard, G. E. Preliminaries of the Revolution (American Nation series). Harper.
McLaughlin, A. C. The confederation of the constitution (American Nation series). Harper.
Turner, F. J. Rise of the new West (American Nation series). Harper.
Hart, A. B. Slavery and Abolition (American Nation series). Harper.
Garrison, G. P. Westward extension (American Nation series). Harper.
Smith, T. C. Parties and slavery (American Nation series). Harper.
Chadwick, F. E. Causes of the civil war (American Nation series). Harper.

Hosmer, J. K. The appeal to arms (American Nation series). Harper.
Hosmer, J. K. Outcome of the civil war (American Nation series). Harper.
Hill, Mabel. Liberty documents. Longmans.
Johnston, Alexander. American orations. Putnam. 4 vols.
Lecky, W. E. H. American revolution. Appleton.
Lodge, H. C. Short history of the English colonies in America. Harper.
Macdonald, William. Select charters and other documents illustrative of American history. Macmillan.
Macdonald, William. Select documents illustrative of the history of the United States. Macmillan.
Macdonald, William. Select statutes and other documents illustrative of the history of the United States.
McLaughlin, A. C. History of the American nation. Appleton.
McMaster, J. B. History of the people of the United States from the revolution to the civil war. Appleton.
Madison, James. Journal of the Federal convention. Scott.
Mowry, W. A. Territorial growth of the United States. Silver.
Parkman, Francis. Conspiracy of Pontiac and the Indian war after the conquest of Canada. Burt.
Parkman, Francis. Count Frontenac and New France under Louis XIV. Little.
Parkman, Francis. A half century of conflict. 2 vols. Little.
Parkman, Francis. The Jesuits in North America in the seventeenth century. Little.
Parkman, Francis. La Salle and the discovery of the great West. Little.
Parkman, Francis. Montcalm and Wolfe. 2 vols. Little.
Parkman, Francis. The old regime in Canada. Little.
Parkman, Francis. Pioneers of France in the new world. Little.
Parkman, Francis. Struggle for a continent. Little.
Rhodes, J. F. History of the United States from the compromise of 1850. 7 vols. Macmillan.
Roosevelt, Theodore. Episodes from The Winning of the West. Putnam.
Rouse, A. L. National Documents. Unit.
Schouler, James. History of the United States of America under the constitution. Dodd.
Sloane, W. M. The French war and the revolution. Scribner.
Sparks, E. E. Expansion of the American people. Scott.
Sparks, E. E. The men who made the nation. Macmillan.
Spears, J. R. Short history of the American navy. Scribner.
Thwaites, R. G. The colonies. Longmans.
Walker, F. A. Making of the nation. Scribner.
Wilson, Woodrow. Division and reunion. Longmans.
Wilson, Woodrow. History of the American people. 5 vols. Harper.

LIST OF USEFUL WORKS IN AMERICAN BIOGRAPHY.

Bolton, Mrs. S. K. Famous American Statesmen. Crowell.
Brooks, E. S. Historic Americans. Crowell.
Brown, W. G. Stephen Arnold Douglas. Houghton.
Brown, W. G. Andrew Jackson. Houghton.
Johnston, R. M. Leading American Soldiers. Holt.
Linn, W. A. Horace Greely. Appleton.
Lodge, H. C. Alexander Hamilton. Houghton.
Lodge, H. C. George Washington. 2 vols. Houghton.
Lodge, H. C. Daniel Webster. Houghton.
Merwin, H. C. Thomas Jefferson. Houghton.
Morris, Charles. Heroes and Progress in America. Lippincott.
Morse, J. T. Jr. Abraham Lincoln. 2 vols. Houghton.
Morse, J. T. Jr. John Adams. Houghton.
Morse, J. T. Jr. Benjamin Franklin. Houghton.
Nicolay, J. G. A short life of Abraham Lincoln. Houghton.
Sedgwick, H. D. Samuel de Champlain. Houghton.
Schurz, Carl. Henry Clay. 2 vols. Houghton.
Thayer, J. B. John Marshall. Houghton.
Trent, W. P. Southern statesmen of the old regime. Crowell.
Trent, W. P. Robert E. Lee. Small.
Tyler, M. C. Patrick Henry. Houghton.
Washington, B. T. Frederick Douglas. Jacobs.
Wister. Owen. Ulysses S. Grant. Small.

ECONOMICS.

One-half year's work in this subject is provided. It is not intended that the high school pupil should attain in any degree a mastery of the principles of economic theory. His mind has not as yet attained the degree of development necessary for such an end, nor has the average high school pupil been trained along these lines of thinking and investigation necessary to a broad and thorough knowledge of the subject.

On the other hand there is a great need that the high school should encourage study along economic lines. Economic matters affect us all so closely that a much more general knowledge of the subject than is now prevalent is desirable. The following suggestions are offered in teaching the course:

1. To set forth a body of economic principles through the medium of an easy text-book, supplemented by the experience of a trained teacher.

2. To test the ability and progress of pupils in the applica-

tion of these principles. This can be best done by assigning to them the solution of original problems, taken from common business conditions. The testing should be concrete. Every principle should be tested by application to matters with which the pupil is familiar.

3. To apply the simpler principles of economic theory after they have been thoroughly mastered by the pupil, to the study of economic problems. No subject requires the exercise of greater skill and adaptation on the part of the teacher. The underlying principles are very simple; the danger lies in the tendency to wander far afield in digressive or abstract thinking. It is highly desirable that any high school offering this course should have a practical working library. A suggestive list is printed at the end of this course.

Either Semester—

RECOMMENDED MINIMUM COURSE.

1. Establish the principles of production and consumption as applied to human wants.

2. The problems and principles of the distribution of goods, including rent, wages, interest, state control, revenue, expenditures, etc.

3. Make frequent visits, if possible, to local stores, farms, and other industrial establishments. Encourage the pupils to test the working of economic problems by questioning the men at work.

SUPPLEMENTARY COURSE.

1. Study of the following material:

(a) Reports and bulletins of the United States Department of Commerce and Labor;

(b) Reports of Interstate Commerce Commission;

(c) Reports of the Washington State Commissioner of Labor.

2. The study of economic conditions in the State of Washington.

WORKING LIBRARY IN ECONOMICS FOR HIGH SCHOOLS.

The following list of books is by no means complete and should be regarded as merely suggestive. There are many others, not included, of equal value. However, a judicious selection from the following list may form the beginning of a good working library for a high school, and others, whether from this list or not, may be added from time to time:

Adams. The Science of Finance. Holt.
Adams & Sumner. Labor Problems. Macmillan.
Bastable. Theory of International Trade. Macmillan.
Bogart. Economic History of the United States. Longmans.
Bucher. Industrial Evolution. Holt.
Bullock. Selected Readings in Economics. Ginn.
Bullock. Taxation and Public Finance. Ginn.
Burton. Crisis and Depressions. Appleton.
Cheney. English Industrial History. Macmillan.
Clare. The A. B. C. of Foreign Exchange. Macmillan.
Clark. Essentials of Economic Theory. Macmillan.
Commons. Trade Unionism and Labor Problems. Ginn.
Cossa. History of Economics. Macmillan.
Day. History of Commerce. Longmans.
Dewey. The Financial History of the United States. Longmans.
Ely. Outlines of Economics; revised edition. Macmillan.
Fillebrown. The A. B. C. of Taxation.
George. Progress and Poverty. McClure.
Ely. Socialism and Social Reform. Macmillan.
Hobson. The Evolution of Modern Capitalism. Scribner.
Jenks. The Trust Problem. McClure.
Jevons. Money and the Mechanism of Exchange. Appleton.
Johnson. American Railway Transportation. Appleton.
————. Ocean and Inland Water Transportation. Appleton.
————. Money and Currency. Ginn.
Marshall. Elements of the Economics of Industry. Macmillan.
Meade. Corporation Finance. Appleton.
Mitchell. Organized Labor. American Book Company.
Patten. The Economic Basis of Protection. Lippincott.
Plehn. Introduction to Public Finance. Macmillan.
Report of the United States Bureau of Labor on Labor Laws in the United States. Department of Labor.
Ripley. Railway Problems. Ginn.
————. Trusts, Pools and Corporations. Ginn.
Seager. Introduction to Economics. Holt.
Seligman. Principles of Economics. Longmans.
Semple. American History and Its Geographical Conditions. Houghton.
Smart. Introduction to the Theory of Value. Macmillan.
Stanwood. American Tariff Controversies of the 19th Century. Houghton.
Taussig. Tariff History of the United States. Putnam.
Townsend-Warner. Landmarks in English Industrial History. Macmillan.
Webb. Industrial Democracy. Longmans.
White. Money and Banking. Ginn.
Willoughby. Workingmen's Insurance. Macmillan.
Wright. Outlines of Practical Sociology. Longmans.

THE SCIENCES.

The entire work in science in the high school course as outlined by the State Board comprises the following:

PHYSICAL GEOGRAPHY, ONE YEAR.
PHYSIOLOGY, ONE-HALF YEAR.
BOTANY, ONE YEAR.
ZOOLOGY, ONE YEAR.
CHEMISTRY, ONE YEAR.
AGRICULTURE AND HORTICULTURE, FOUR YEARS.
GEOLOGY, ONE-HALF YEAR.
ASTRONOMY, ONE-HALF YEAR.
PHYSICS, ONE YEAR.

General Suggestions—

1. The increasing demand in the industrial world for scientific and technical knowledge serves to increase the demand for instruction in all branches of science in our secondary schools. For this reason the practical application of all principles of science should be constantly emphasized. This practical economic demand for scientific knowledge presents to high school science work a great opportunity.

2. The laboratory method of instruction must be universally employed. There is no such thing as teaching science satisfactorily from the text-book alone. At the same time, the high school pupil cannot be expected to go into the field of original investigation. That kind of work must be left to the college or university.

3. Simple experiments, which can be performed with simple apparatus and which bring out truths easily understood by pupils of secondary grade should be used as much as possible. Above all, the laboratory must not be used by the teacher as a place in which to entertain and mystify the pupil. It is intended as a means of making the phenomena of natural science as simple as A. B. C. to the inquiring adolescent mind.

4. For the foregoing reasons, it is desirable to have the pupils, under the direction of the teacher, make simple pieces of

apparatus, either during or outside of school hours, provided that the main object—to train students of science, not artisans—is kept constantly in mind.

5. The laboratory should be always in a room with abundance of light. It should be fitted first of all with good, plain, substantial tables, and running water if possible. Gas is a useful adjunct, but by no means indispensable.

6. In laboratory practice the pupil should be led to assume a scientific attitude of mind. He should never expect a result obtained in quantitative work to be absolutely correct and should know why. Most cases of correct results by experimentation are accidental. The pupil should know that the aim in the laboratory is not to get the result known to be correct but to do his best while working under the handicap of sources of error due to inexperience and the imperfection of apparatus at his disposal. The scientific attitude toward wrong results is this: Is my result near enough right so that by allowing for the errors of experimentation and taking them into consideration I feel that I can accept the principle to be true? Thus the student is brought to see how inaccurate results are in many cases more significant than true ones in verifying principles.

7. The experiences, needs, and interests of the pupil should be the deciding factor as to method and material in any science. Even the aim to cover a prescribed amount of ground is secondary. Do not hurry. Never take it for granted that because the pupil can recite the facts they are understood. The course in any subject should be a process of emancipation from the fetters of the text, the manual and the guidance of the teacher, culminating in complete freedom—the sound reaction sought.

8. The teacher should be clear-sighted enough to always see the ideal behind the imperfections of the pupil and should always be conscious of the possibilities in the child which others do not see.

PHYSICAL GEOGRAPHY.

General Suggestions—

1. This subject, while given in the first year of the high school course, is a branch of study involving some elements of all sciences. It serves for this reason as an excellent means of introducing the pupils to the field of scientific inquiry in general.

2. No matter how lacking in laboratory equipment a high school may apparently be, some laboratory work will be attempted by the competent teacher of this subject. The matter of assembling the simpler materials for laboratory work is discussed elsewhere.

3. Practically any location in the State of Washington offers an excellent opportunity for field work. In fact, the entire state may well be called the physiographer's paradise. Soil, vegetation and climatic conditions are such as to stimulate the keenest inquiry on the part of the lover of this fascinating branch of learning.

4. The ultimate aim of the course is to give the pupil a knowledge of the relation of man to his environment; for this reason everything that goes to make up natural human environment becomes a field of study.

RECOMMENDED MINIMUM COURSE.

1. A systematic study of the subject, based on a standard text-book. The treatment in various texts differ widely, but the following points should be emphasized in all:

(a) The planet on which we live and its relation to the solar system.

(b) Distribution of water over the earth; erosion; the drainage of continents; glaciers, etc.

(c) The distribution of land; land-relief, earthquakes, etc.

(d) Causes and nature of atmospheric movements; climatic conditions.

2. Regular laboratory work. This may well be based on some special laboratory manual and physical geography note-book, of which there are many useful types in circulation.

3. Field work. The instructor should seek to take advantage of fine fall and spring days for this purpose. (See suggestions below for this work.)

SUPPLEMENTARY COURSE.

1. The distribution of animals and plants over the face of the earth.

2. The distribution of the human race, with particular study of the causes which lead mankind to gather at natural geographical centers.

3. Natural economic products of the earth; the effect of advantageous conditions of soil, etc.

LABORATORY EQUIPMENT.

Particularly for the information of instructors establishing laboratories for high schools the following list of pieces of laboratory equipment is given. The first twelve of these are practically indispensable for any laboratory work. Additions should be made to the laboratory equipment from time to time of articles selected from the numbers beyond the first twelve:

1. Set of wall maps for physical geography.
2. A compass.
3. Half dozen meter sticks.
4. One or more thermometers.
5. A mercurial barometer. (The instructor should explain fully the construction of this piece of apparatus.)
6. Three bar magnets.
7. Magnetic needles.
8. Ball and ring, to demonstrate expansion and contraction.
9. A prism or spectroscope.
10. A number of topographic maps as issued by the U. S. Geological Survey. These may be procured by ordering them direct from the Chief of the U. S. Geological Survey at Washington, D. C. They cost not over three cents each, if purchased in lots of one hundred. The number of copies of each map needed will depend on the number of pupils in a class. Two students can well work together and use the same map. An excellent book for the use of the teacher in this work is "The Use of Government Maps in Schools," published by Henry Holt & Co.

11. The daily weather charts of the U. S. Weather Bureau. These are ordinarily sent daily to school superintendents. If not regularly received, they may be procured upon application to the Division Chief of the U. S. Weather Bureau, at Seattle, Spokane, Walla Walla, or Portland, Oregon. They should be procured and carefully kept for this purpose.

12. A mineral collection, consisting of about twenty minerals and twenty rocks, each labeled and in a separate tray, with a set of unlabeled duplicates. Such sets may be procured from manufacturers of scientific apparatus and should be added to from time to time by the wideawake instructor.

13. A soil thermometer.

14. A bread roller, shears and brush for map-mounting.

15. A supply of profile paper 20 inches wide.

16. A globe of suitable size.

17. A set of maximum and minimum thermometers.

18. A sun-board, with book of directions.

19. An aneroid barometer with adjustable altitude hand.

20. A tellurian.

21. A spherical blackboard.

22. A rain gauge, U. S. Weather Bureau form.

23. A sight compass in watch case, needle 30 mm. with agate cap.

24. An improved mercurial barometer, Fortin principle, with vernier in English and metric system, and C. and F. thermometer.

25. An anemometer reading to 10,000 miles in hundredths.

26. A specific gravity balance, or Jolly balance.

27. A set of weights in block, ranging from 100 g. to 1 cg.

28. A hammer with wedged-shaped end for breaking rocks.

29. A sufficient number of tripod lenses.

30. A barograph.

SUGGESTIONS AS TO FIELD OBSERVATIONS.

In making field excursions the points to be studied will depend on the locality. Such topics as clouds and their movements, weathering, erosion, transportation, deposition, river

currents, waves, tides, rocks, minerals, foldings, faults, dikes, evidences of upheaval and subsidence, natural slope of different materials, land forms, location of highways, soil, falls, rapids, water power, harbors and distribution of plant and animal life are of special importance.

SUGGESTED LABORATORY EXERCISES.

The following list of laboratory exercises is intended as suggestive. Others which the instructor may devise are fully as valuable. In selecting exercises the instructor should be guided by the needs and opportunities of the class; at least 30 exercises are to be regarded as a minimum requirement for a school doing good work for a year.

1. Show direction of rotation and revolution; distance of the earth from the sun at aphelion and at perihelion.
2. Show explanation of phases of the moon and reasons why eclipses do not occur every month.
3. Construct diagrams showing partial and total lunar eclipses .
4. Determine the length of day at any latitude at any time of the year.
5. Find the place of sunrise and of sunset at any latitude at any time of the year.
6. Construct a diagram showing position of earth, moon and sun at the time of the several phases of the moon.
7. Study of ocean current maps.
8. Study of types of shore lines.
9. Make map of selected steamer routes across the Atlantic and Pacific and explain why the routes are selected, using the globe.
10. Location and migration of heat equator.
11. Make complete weather maps from furnished data.
12. Comparison of areas to scale.
13. Make vertical section of relief maps to scale.
14. Write description of models.
15. Make drainage map of United States.

16. Two excursions in autumn and two in spring, described in detail.

17. Determine relative heat received from the sun at different altitudes.

18. Construct and interpret sunrise and sunset curves.

19. Determine the observer's latitude from the elevation of north pole.

20. Locate all lines showing latitude and longitude.

21. Interpret a contour map as to drainage, distances, slopes, and relative heights.

22. Make vertical sections from contour maps.

23. Make a contour map from given data.

24. Make interpolations between meridians and parallels.

25. Experiment with Foucault's pendulum.

26. Determine altitude by use of barometer.

27. Determine the dew-point and calculate from data the relative and the absolute humidity.

28. Account for differences in isothermal charts for the world for January and July.

29. Account for position and migration of heat equator and cold pole.

30. Account for terrestrial winds in the months of January and July.

31. Interpret records of thermograph, barograph and wind direction and study their mutual relations.

32. Keep for one month a daily record of pressure, temperature, wind direction, state of sky, humidity, location of approaching low and precipitation.

33. Study the general wind direction about centers of low and high areas from weather maps.

34. Find the direction and average rate of the progressive movement of a storm center in the United States.

35. Make an isobar map of the United States from furnished data.

36. Make an isotherm map of the United States from furnished data.

37. Study the distribution of cloudiness and rainfall about several storm centers.

38. Forecast weather conditions from furnished data.

39. Study cold waves and northeasters.

40. Plot curve representing daily rainfall for one year at a given station from furnished data.

41. Plot tidal curve for a given station for the month of January from given data.

42. Interpret the tidal curve as to spring and neap tides and diurnal inequity.

43. Test sea water for density, taste and amount of gas and of solid matter in solution.

44. Construct a diagram showing high, low, spring and neap tides, and make explanation.

45. Study trade routes across the Atlantic and Pacific oceans from pilot charts.

46. Make an orderly arrangement of five minerals to show a scale of hardness.

47. Study quartz, feldspar, mica and calcite as types of rock-forming minerals.

48. Study two ores of each of the following: Iron, copper, lead and zinc.

49. Study samples of soil.

50. Study salt, sulphur, gypsum and graphite as types of non-metallic minerals of direct economic value.

51. Study eight or ten common rocks.

52. Construct a river profile.

53. Study regular shore lines, Pacific Coast topographic sheet.

54. Make a collection of glaciated and of water-washed pebbles.

55. Study distribution of coniferous, deciduous and tropical forests, and the relation of such distribution to climate.

56. Study distribution of areas producing the most important fiber plants and the relation of such distribution to climate.

57. Study distribution of animal life and its relation to climate.

58. Study distribution of areas producing the most important fruits and the relation of such distribution to climate.

59. Study distribution of human population as to density and the relation it bears to soil, climate, water power, harbors, etc.

SOME REFERENCE BOOKS ON PHYSICAL GEOGRAPHY.

Archibald. Story of the Earth's Atmosphere. Appleton.
Davis. Practical Exercises in Physical Geography and Atlas to Accompany the Same. Ginn.
Davis. Elementary Physical Geography. Ginn.
Fairbanks. Practical Physiography. Allyn and Bacon.
Gilbert and Brigham. Physical Geography. Appleton.
Gregory, Keller and Bishop. Physical and Commercial Geography. Ginn.
Mill, H. R. The Realm of Nature. Scribner.
National Geographic Magazine. National Geographic Society, Washington, D. C.
Physiography of the United States. American Book Company.
Russell. Glaciers of North America. Ginn.
Russell. Lakes of North America. Ginn.
Russell. Rivers of North America. Ginn.
Russell. North America. Appleton.
Salisbury, R. D. Physiography. Holt.
Salisbury and Atwood. Interpretation of Topographic Maps. Government Printing Office, Washington, D. C.
Shaler, N. S. Man and The Earth. Duffield.
Shaler, N. S. Outlines of the Earth's History. Appleton.
Wright. Manual of Physical Geography. Ginn.

PHYSIOLOGY.

1. The object of the high school course in physiology should be to teach the individual how to be most efficient physically, and best able to meet the work of everyday life. For this reason the course should not be allowed to fall to the level of a review of what the pupil has covered in the elementary grades. The point of view should be much broader. Certain facts of biology, chemistry, psychology, hygiene, etc., should be included and applied with a view to inculcating proper habits of mind and body, and to encourage right living.

2. Emphasis should be laid on the value of suitable bodily and mental exercise, proper diet, digestion, sleep and ventilation; public sanitation and hygiene.

3. Lay stress on the positive rather than the negative. No subject offers to the teacher better opportunity to say "do" rather than "don't." The adolescent is ambitious to be strong and vigorous—a fact of which the instructor should take the fullest advantage.

4. Vivisection is forbidden by law in this state. (See Laws of 1897, Chapter XVI.)

5. While the outline course of study adopted by the State Board does not make definite provision for the location of this subject, it is urged that it be offered in the eleventh and twelfth grades, either semester.

6. Laboratory work should include experiments of a strictly physiological nature. The pupils of any high school should not be deprived of the opportunity to do laboratory work on account of a lack of apparatus. Much of the best work can be done through experiments carried on by the pupils themselves and by means of simple home-made apparatus. A study of all such matters as morbid changes and pathological lesions are both unnecessary and undesirable. The use of a good laboratory manual is recommended. (See list of reference books.)

RECOMMENDED MINIMUM COURSE.

1. Brief review of human anatomy, including the organs of digestion and respiration.

2. Elementary study of the cells; emphasize the interdependence of all cells and organs.

3. The study of foods; their effects and values.

4. The prevention and treatment of ordinary human ailments. Lay particular stress on the undesirability of patent nostrums.

5. The importance of sanitation and ventilation.

6. Laboratory exercises. (Use any good manual.)

SUPPLEMENTARY WORK.

1. Laboratory and classroom study of beneficial and detrimental bacteria.

2. Original investigation of neighboring conditions of sanitation, drainage, etc.

3. Reference reading and reports on the larger subjects of public health.

REFERENCE BOOK SUGGESTIONS IN PHYSIOLOGY.

Allen. Civics and Health. Ginn.
Blaisdell. How to Keep Well. Ginn.
Hough & Sedgwick. The Human Mechanism. Ginn.
Jewett. The Body and Its Defenses. Ginn.
Peabody. Studies in Physiology. Macmillan.

BOTANY.

General Suggestions—

1. Four general objects should be sought through the study of botany in the high school: (a) A knowledge of plant physiology, thus preparing the way for agriculture; (b) to impress upon the student the dependence of agriculture upon botany; (c) to point out the unity of the plant world as shown by the progressive changes in going from the lower to the higher; (d) a general understanding of the sex problem without any embarrassment or indelicacy.

2. The pupil should be trained to observe accurately, to reason logically, and to express his thoughts clearly and exactly. To this end a permanent notebook should be kept in which to report field and laboratory work. The notebook should excel in quality rather than in quantity. Notebook work

should be graded on English, spelling, punctuation and neatness. It is worth doing well.

3. All drawings should be made from objects. Copying other drawings or pictures is worse than useless. Drawings need not necessarily be artistic but they must be accurate. The pupil should make large clear figures and in them show clearly what he is trying to do.

4. Plants should first be studied from the viewpoint of the plant itself—what it is endeavoring to do, what it has to do it with, and how it does this. Then should follow the study of its relation to man. The facts and principles acquired should be associated with agriculture, manufactures, pharmacy, etc.

5. In all localities in which special agricultural interests predominate the work should be modified to meet the special needs of the region. Make the work practical, not forgetting, however, that we must know what a plant is trying to do before we can go very far in modifying its endeavors for our own benefit.

6. The bulletins of the U. S. Department of Agriculture, and those of the state agricultural colleges will be found to contain useful information. Text-books on elementary agriculture will help greatly.

7. In all papers on practical botanical subjects, the aim should be to require correct and accurate discussions of what has actually been observed. Encourage the use of simple everyday language. Avoid technical terms. When papers or notebooks have been corrected by the instructor, they should be handed back to the pupil for revision promptly. Much of the force of this class of instruction is lost by a pupil's papers being retained by the instructor till the subject has become stale. Correction done in this way is practically worthless. It is better, if the instructor's time is very limited, to have the pupils exchange papers and correct them in class and then hand them right back to the writers while the subject-matter is fresh in everyone's mind.

RECOMMENDED MINIMUM COURSE.

The work in botany should be continuous through the year, and as well adapted to seasonal conditions as possible.

1. Work from the known to the unknown. Perhaps the best place to begin is the leaf, since its physiology explains the other parts of the plant; and since the study of the leaf activities also naturally leads to habitat, to the world's food supply, and the share of the plant in man's welfare.

2. Follow the leaf with a study of the stem and the root. Emphasize physiology rather than structure. The study of the stem as the means of elevating the leaves to light and thus necessarily exposing them to greater evaporation naturally leads to the discussion of the conditions under which forests exist in nature and the conditions necessary for successful tree growth. Wood structure is important, for upon it depends the relative value of woods. The physiology of the root is an important subject.

3. Seeds naturally follow the study of the flower, but since the time for the analysis of flowers is usually short in the spring, seeds may be studied in the winter when other material is scarce. Associate the seed as the storehouse of food for the plant with its use by man as one of the greatest sources of his food.

4. During the winter the life history of typical species of the lower forms may well be studied in laboratory and recitation. Most of the material can be collected during the year and preserved, in a dark place, in a one per cent. solution of commercial formaldehyde. The fungi and bacteria are the most important economically. Choose disease fungi as types so far as possible, and from this lead to the philosophy of spraying and the treatment of seed. From bacteria give the elements of sanitation as applied to your region, and the principles of personal hygiene.

5. In the spring analyze a considerable number of our common wild flowers. This is to teach the scientific method of classification, and to enable the pupil to find alone the name of

a plant. Careful study of representatives of different families should precede the analysis. Pupils should collect their own flowers so far as possible, and make notes on their environment and the adaptation of the plants to this, thus fixing the principles of ecology.

6. There should be at least two double periods of laboratory work per week.

SUPPLEMENTARY COURSE.

1. A wide acquaintance with the plants of the region by the analysis of a very large number of species.

2. Further experiments in plant physiology, especially the performance and detailed discussion of such experiments as require great care and exactness.

3. A study of weeds; why they are weeds, their relative importance, means of dispersal, means of combating them.

SUGGESTIVE LIST OF LABORATORY EQUIPMENT.

The following list of laboratory equipment is sufficient for the use of twelve pupils working at the same time. In equipping a laboratory for a greater or less number, the instructor must use his own best judgment:

4 compound microscopes.
2 laboratory tables, with drawers, 96 inches long, 36 inches wide, 29 inches high.
12 pairs scissors, fine.
12 scalpels.
12 pairs forceps, medium fine, straight points.
24 dissecting needles.
6 sectional razors.
12 dissecting lenses, one-inch focus.
1 balance, with weights.
2 gross glass slides, 3x1 inches.
4 ounces cover glasses, ¾ inch square.
24 Syracuse watch glasses.
24 pipettes, with rubber bulbs.
2 pounds glass tubing, assorted sizes.
1 lot large flat dishes, glass or porcelain.
24 Mason or Economy fruit jars, quart.

24 test tubes.
1 lot guarded bristles.
1 galvanized iron waste can, with cover.
1 lot battery jars, large.

LIST OF BOOKS FOR REFERENCE.

From the following list of reference and text-books a good working library may be selected. Those which would likely be most used in the average school are marked with a *.

*Atkinson's Botany for High Schools (Henry Holt), about..... $1 25
Arthur & MacDougal's Living Plants and Their Properties (Morris & Wilson, Minneapolis)..... ....
Bailey's Botany; An Elementary Text Book (Macmillan)..... 1 10
Bailey's Lessons with Plants (Macmillan)..... 1 10
Bailey's Plant Breeding (Macmillan)..... 1 25
Beal's Seed Dispersal (Ginn & Co.)..... 35
*Bergen & Davis' Principles of Botany (Ginn & Co.)..... 1 50
Bergen & Davis' Laboratory and Field Manual of Botany (Ginn & Co.)..... 90
Blanchan's Nature's Garden (Doubleday Page)..... 3 00
Coulter's Textbook of Botany (Appleton)..... 1 25
Coulter's Plant Structures (Appleton)..... 1 20
*Coulter, Barnes & Cowles' Textbook of Botany (American Book Co.), about..... 3 50
Conn's Bacteria, Yeasts and Moulds in the Home (Ginn & Co.)... 1 00
Clute's Fern Allies (W. N. Clute, Joliet, Ill.), about..... 2 00
Frye & Rigg's Laboratory Exercises in Elementary Botany (Ginn & Co.), about..... 50
*Kellogg's Timber Supply of the United States (Supt. Documents, Washington, D. C.), about..... 50
Leavitt's Outlines of Botany (American Book Co.)..... 1 00
MacDougal's The Nature and Work of Plants (Macmillan)..... 80
Goff's Principles of Plant Culture (Judd), about..... 1 00
*Osterhout's Experiments with Plants (Macmillan)..... 1 25
Pinchot's Primer of Forestry (Supt. Documents, Washington, D C.), about..... 50
Roth's First Book of Forestry (Ginn & Co.)..... 75
*Stevens' Plant Anatomy, 2d ed. (P. Blakiston's Sons & Co., Philadelphia)..... 2 50
Stevens' Introduction to Botany (Heath)..... 1 25
Spillman's Grasses of the United States (Judd), about..... 1 25
Sachs' History of Botany (Clarendon Press), about..... 2 50
*Strasberger and others' Textbook of Botany (Macmillan)..... 4 50
Toothaker's Commercial Raw Materials (Ginn & Co.)..... 1 25
*Sudworth's Forest Trees of the Pacific Slope (Supt. of Documents, Washington, D. C.)..... 60

Sargent's Manual of the Trees of North America (Houghton Mifflin) 6 00
Waters' Ferns (Henry Holt) 3 00
Bergen's Essentials of Botany (Ginn & Co.) 1 50
Jordan's General Bacteriology (W. B. Saunders) 3 00

ZOOLOGY.

General Suggestions—

1. The aim of the work in zoology in high schools should be to give the pupil some scientific knowledge of animal life in general. They should be taught "to see life clearly, and see it whole." From this point of view, animal life has especial and appropriate interest. The natural-history phase of the subject should be emphasized.

2. The work should be begun in the fall with a study of the common insects. The pupil should at first get a conception of the bodily organization and nature of an animal, and how the animal is adapted to its environment. Less time may be profitably spent on the memorization of terms wholly foreign to the pupil's life and manner of thinking, and more in getting a good idea of the general structure of the typical animal bodies and the functions of their principal or characteristic organs.

3. In the winter time the study of lower forms may be carried on. A simple aquarium may be easily constructed in which to keep abundant and interesting material for the use of any class. Collecting specimens for such purposes may be made part of the field work in the fall. Make a list of the birds and animals that are active in winter. Devote the latter part of the course to the study of the vertebrates. In this way, the course may be made an excellent basis for effective work in human physiology.

4. Economic zoology is of the highest importance. The more important insect pests, also frogs, toads, snakes and birds have a practical importance that should be made clear. The mosquito as a transmitter of malaria and yellow fever, the housefly as a distributer of tuberculosis and typhoid, the capac-

ity of many domestic animals in carrying disease germs—these are a few of the interesting problems which common animals present. The choice of types which have an important bearing on human life need not entail a sacrifice of pure science to practical interests. Few subjects are better calculated to show the biological relationship between various members of the organic world than economic zoology.

RECOMMENDED MINIMUM COURSE.

1. Study of the anatomy, environment, life habits and history of at least one of the following: Grasshopper, butterfly, bee, beetle.

2. Study of a crayfish or fish. Emphasize anatomy; methods of locomotion, food-getting, and breathing; life history, care of eggs and young; uses of food and oxygen; importance to man.

3. Study of the frog and its relatives.

4. Study of the earthworm; emphasize economic value.

5. Study of a bird, showing methods of eating, drinking and locomotion; value as a destroyer of insect pests, scavenger, etc.; necessity of methods of bird protection.

6. Lower forms, including (if a microscope is available) protozoa, porifers, coelenterates, and echinoderms.

7. Study of vertebrate forms—mammals, etc.

8. Notebook and field work. The same suggestions as those given under this head in the course in botany apply here.

SUPPLEMENTARY WORK.

1. Study of additional forms—arachnids, myriapods, mollusks, reptiles, etc.

2. Have pupils keep records of appearance and disappearance of migratory and hibernating animals.

3. The work of the national and state governments in exterminating insect pests.

LABORATORY EQUIPMENT.

The same list of laboratory equipment as suggested for the study of botany may be used in zoology.

REFERENCE BOOKS.

Chapman. Bird Life.
Chapman and Reed. Birds of Eastern United States.
Chapman and Reed. Color Key to North American Birds.
Experiment Station Bulletins. May be had on request by writing to The Director, State Experiment Station, Pullman, Wash.
Hornaday. American Natural History.
Jordan, D. S. Manual of Vertebrate Animals of Northern United States.
Jordan, Kellog and Heath. Animal Studies. Appleton.
Linville and Kelly. Text-Book in General Zoology. Ginn.
Sanderson, E. D. Insects Injurious to Staple Crops.
Yearbook of the Department of Agriculture.
Bulletins and circulars from the Department of Agriculture:

1. The Principal Insect Enemies of Growing Wheat.
2. Bee Keeping.
3. Some Insects Injurious to Stored Grain.
4. Some Common Birds in Their Relation to Agriculture.
5. Does It Pay the Farmer to Protect the Birds?
6. Important Insecticides.
7. Usefulness of the Toad.
8. The Carpet Beetle or Buffalo Moth.
9. Canker Worms.
10. Mosquitoes and Fleas.
11. House Flies.
12. The True Clothes Moth.
13. The Common Squash Bug.
14. Cockroaches.
15. How Birds Affect the Orchard.
16. Insects as Carriers and Spreaders of Disease.
17. Audubon Societies in Relation to the Farmer.
18. Insects Injurious to Beans and Peas.
19. Bulletins of the Biological Survey.

CHEMISTRY.

General Suggestions—

1. In practically all cases, a year's work is the most that can be offered in chemistry in the high school. That is all that is provided for by the State Board's outlined course of study. For this reason the same suggestion holds that is made in regard to botany and zoology, that the work should be practical and general, rather than investigational and abstract. A certain knowledge of chemistry underlies a great many of our life-activities, and it is just this knowledge that the high school pupil should obtain.

2. The text-book chosen should be fairly simple. Avoid over-technical descriptions of chemical elements and hazy discussions of chemical theory. Such statements of chemical theory as are given to the class should be couched in everyday language, and the illustrations used should be drawn from everyday sources.

3. A very able critic of our high schools, State Inspector George B. Aiton, of Minnesota, recommends, as regarding the course in chemistry where agriculture and household economy are taught in the high schools, that about Thanksgiving the class in chemistry be divided into two sections, one composed of the girls, taking up matters of sanitation, and diet; the other studying the simpler problems of agricultural chemistry. He offers the further practical suggestion that each of these two sections might recite every other day, with laboratory days intervening, and that in the spring these two sections be reunited for a review of the general principles of the subject.

4. Every effort should be put forth to make the laboratory work, done by the pupils in chemistry, teach and stimulate them to scrutinize with the eye of a chemist their surroundings and the materials with which they work every day. In the subject of chemistry lies the foundation of so many activities and industries of the present day as to give unlimited opportunity for the pupil to apply the principles of chemistry to his daily con-

tact with his environment. He should learn, for instance, that there is a chemical significance in all such things as colors, odors, taste, rust, stains, cookery, farming, explosions, etc.

5. In so far as possible the laboratory work ought to supplement the text-book work or should illustrate principles therein discussed. Haphazard laboratory work is exceedingly detrimental. It should be the aim in the high schools to teach the pupils to observe carefully, to draw proper conclusions from the facts which they observe, and to be able to see in the phenomena of life something besides the mere phenomenon itself, i. e., they should be able to attach some meaning to it and know something of the mechanism involved. Accuracy in expression and clearness in thought, and keenness of vision ought to be emphasized in an elementary class in chemistry.

6. Above all, the instructor should not try to give a college course in chemistry. The field of chemical knowledge is so broad and its mastery may be divided into so many convenient degrees that it is possible to have a high school course of chemistry adapted to the needs and thinking of every high school pupil, whether he goes to college or not, independent of college and university courses. There is danger that in attempting to reach up to college requirements the high school teacher may bring into the course in chemistry certain features so foreign and therefore distasteful to the pupils as to repel instead of cultivate the greatly-to-be-desired love of the subject.

7. Always use common terms and names as much as possible. The pupil should be taught to avoid the use of such meaningless terms as "stuff" as applied to any chemical compound. Chemicals have names, just the same as all other objects, both animate and inanimate. If a pupil has sodium-chloride, teach him to call it such, or better by the common name of salt, rather than refer to it as "stuff."

RECOMMENDED MINIMUM COURSE.

No attempt will be made here to outline a course in chemistry in detail. The following are the general minimum requirements for a year's work.

1. The thorough study of at least one standard text-book to the end that the pupil may acquire an accurate and corrected knowledge of the principles, facts and laws of elementary chemistry.

2. Instruction by means of demonstrations. These should form a basis for questioning upon general principles of pure and applied chemistry.

3. Individual laboratory work, covering at least thirty-five simple, practical experiments.

SUPPLEMENTARY COURSE.

1. The simpler facts connected with the chemistry of foods, with especial reference to the changes that take place when foods of various kinds are cooked.

2. Chemistry of Soils. This should extend rather toward giving a pupil a general knowledge of the components of the various types of soil than a mastery of so difficult a subject as soil analysis.

LABORATORY EQUIPMENT AND MATERIALS.

The study of chemistry, perhaps more than any other branch of science, requires a laboratory, however simple, and chemicals for use in experimentation. For the latter reason, it must be borne in mind that each pupil will use up or destroy a certain amount of laboratory supplies each year. From three to six dollars per year per student must be expended on supplies.

It is not necessary to furnish the laboratory in an expensive manner. The essentials are a well lighted room, furnished with solid tables or benches; a gas connection or a good alcohol lamp for each pupil; running water if available, and a supply of distilled water; at least one conveniently located sink; a case for chemicals and apparatus, hood with abundant, straight-up, open draft. Tables or benches should be thirty-eight to forty inches in height. The best type of bench or table is that fitted with upper shelves for the common reagents, and drawers and cupboards below, so that each student may have his own set of apparatus, lock it up and be responsible for its return in good condition at the end of the term.

Apparatus and chemicals may be purchased through a number of laboratory supply houses. (See list on page 122).

If a high school can use and afford a list of supplies aggregating in cost $250.00 or more, it will pay to have the material imported direct from abroad. Any educational institution may, under the laws of the United States, import such material duty free for purposes of instruction. This method will effect a very considerable saving of expense, and the importation may be made through any of the laboratory supply houses referred to above.

LIST OF REFERENCE BOOKS.

In making the following list the aim has been to select a number of the books of greatest value to high school pupils rather than to make a complete list:

Benedict. Chemical Lecture Experiments. Macmillan.
Bloxam. General Inorganic and Organic Chemistry.
Bailey. Sanitary and Applied Chemistry. Macmillan.
Dobbin and Walker. Chemical Theory for Beginners. Macmillan.
Faraday. Six Lectures on the Chemical History of a Candle. Harper.
Hardin. Liquefaction of Gases. Macmillan.
Jones. Elements of Physical Chemistry. Macmillan.
Lassar-Cohn. Chemistry in Daily Life.
Ramsay. Experimental Proofs of Chemical Theory for Beginners. Macmillan.
Ramsay. Gases of the Atmosphere. Macmillan .
Venable. Short History of Chemistry. Heath.
Alexander Smith, General Chemistry. Century Company.
Newth, Inorganic Chemistry. Longmans.
Freer. General Chemistry. Allyn & Bacon.
Bailey, Sanitary Chemistry. Macmillan.
Thorpe. Essays. Macmillan.
Roscoe & Schorlemmer. New edition. 3 vols, 10 parts. Appleton.
Thorpe. Industrial Chemistry. Macmillan.

AGRICULTURE.

The subject of agriculture as a branch of study for high schools, while it has been in regular use in many localities in the United States for several years, may be said as yet to be only in its infancy. Its introduction into the high school course has come about in response to the ever-increasing demand that the course of study in the schools be more closely adapted to the needs of practical life. Especially is there a demand that a full course in agriculture and country life be made a part of the regular work of the high school. Perhaps the general feeling was voiced by President Roosevelt in his message at the beginning of the second session of the Fifty-ninth Congress in which he said:

"Farming, at least in certain branches, must become a technical profession. There must be open to farmers the chance for technical and scientific training, not theoretical merely, but of the most severely practical type. The farmer represents a peculiarly high type of American citizenship, and he must have the same chance to rise and develop as other American citizens have. Moreover, it is exactly as true of the farmer as it is true of the business man and the wage earner, that the ultimate success of the nation of which he forms a part must be founded not alone on material prosperity, but upon high moral, mental and physical development. This education of the farmer—self-education by preference, but also education from the outside, as with all other men—is peculiarly necessary here in the United States, where the frontier conditions even in the newest states have now nearly vanished, where there must be a substitution of a more intensive system of cultivation for the old wasteful farm management, and where there must be a better business organization among the farmers themselves."

The four years' work offered need not necessarily be given in the order in which it is outlined. The first year's work, dealing as it does with the fundamental principles of agronomy should perhaps be given if any agriculture at all is offered. An understanding of the principles of agronomy is essential to the mastery of certain features of any other line of agriculture.

It is urged that the attempt be always made to offer that branch of work most closely related to the environment of the young people in any given community; that is, if the interests of the community are largely dairying, the work in dairying should be given by all means; if largely horticulture, that branch should have preference, and if principally the cereal crops a study of that subject should be included.

First Year. First Semester—

RECOMMENDED MINIMUM COURSE.

1. The soil—its origin, formation and distribution; the physical properties of soil in relation to water, heat and air.

2. Soil moisture; amount of moisture required for different farm crops.

3. The aeration of the soil; the amount of plant food contained in the soil.

SUPPLEMENTARY COURSE.

The chemical properties of the soil; humus; soil temperature and its control.

SOILS; LABORATORY EQUIPMENT LIST AND EXPERIMENTS.

The following list of articles necessary for the equipment of a small soil laboratory, and list of selected experiments in soils, have been suggested by the State College, as have also those under the subjects of dairying and farm crops on other pages:

EQUIPMENT FOR SOIL LABORATORY.

Balances (metric).
Graduates (100cc).
Crucibles (small).
Oven and burners.
Bunsen burners.
Flower pots.
Capillary tubes.
Glass tubing, 1 inch by 5 feet long.
Samples of fine seed, coarse sand, clay loam and humus.
Mortars and pestles.
Pienometers.
Soil auger and bottles.

SUGGESTED EXPERIMENTS.

1. Examination of Soils—

Give each student a sample each of coarse sand, fine sand, clay, loam and humus.

Examine each as to color, relative size of particles, arrangement of particles, and shape of particles. Wet each and note change in color. Are all of the particles in any one sample uniform as to color, shape or size? If not, name the variations. If the particles of sand in any sample are well rounded on the edges, what might this suggest? The various colors of sand probably came originally from different sources. How many different sources are indicated in each?

2. Highest Efficiency Quantity of Water for Tillage—

Weigh out one hundred grams of each type of soil, add two or three cc. of water at a time (keeping accurate account of the amount of water added), and mix up thoroughly. Then add two or three grams more and mix carefully. Continue until the soil is mellow but not sticky. The soil should not form a solid ball when squeezed in the hand, but should crumble easily—just so that it will stand alone in a ball but will crumble when touched. The amount of water added to the one hundred grams of soil will be the highest efficiency percentage of moisture required to make the soil tillable. Tabulate results. How do these results compare with the results of the experiment on the water-holding capacity of soils? Should soils be completely filled with moisture for crops?

3. Specific Gravity of Soils (apparent)—

Fill one of the small crucibles just level-full of water, then measure the water in cubic centimeters. This will be the volume of the crucible. Empty and dry. Now weigh the crucibles in grams and fill just level full of each type of soil in turn and weigh each carefully. This gives the weight of the crucible full of each type of soil. To find the apparent specific gravity, divide the weight by the volume.

A cubic foot of water weighs 62.4 pound. How much would a cubic foot of each kind of soil weigh?

An acre-foot is a layer of soil a foot thick, covering an acre. How much would an acre-foot of each soil weigh?

4. Water-Holding Capacity of Soils—

Determine for each type of soil.

If possible, use one-inch glass tubing six inches long, with cheese cloth over the end.

Weigh each tube carefully, fill two-thirds full of soil and weigh; now set in a vessel of water, just so the bottom will touch the water.

Do not disturb. Watch carefully and when wet all over on the surface remove from the water, let drain two or three minutes and weigh. Subtract the weight of the dry soil from the weight of the wet soil to determine the amount of water taken up by the soil. (Deduct the weight of the tube in each case.) To determine the percentage of water-holding capacity, divide the amount of water taken up by the weight of the dry soil and multiply by one hundred. Tabulate results. What is the relation of size of particles to water-holding capacity?

5. Hygroscopic Moisture of Soils—

What is hygroscopic moisture? Determine for each type of soil. Weigh the crucible carefully and mark the weight on crucible; add two or three grams of soil and weigh carefully; put in oven and dry at a temperature of 110° C. for five hours. Weigh, subtract weight of dish to get weight of soil in each case. Subtract the weight of the soil before drying; the difference will be the hygroscopic moisture which was driven off by heating. Tabulate results. Can you account for the wide variation in the different kinds of soil?

6. Percentage of Humus in Soils—

What is humus? How does it get into the soil? Weigh the crucible carefully, put into it two or three grams of soil and weigh carefully, put over the burner and burn for at least one hour—as hot as you can get it—let cool, and weigh again; subtract the weight of soil before burning; the loss was the humus or organic matter. The hygroscopic moisture was also driven off. Deduct the amount of hygroscopic moisture from the first weight of the soil before working out results, then divide the loss by the weight of dry soil, minus the hygroscopic moisture, and multiply by one hundred to get the percentage of humus. Tabulate results. How many tons of humus in an acre-foot of each type of soil? If you added ten tons of well-decayed manure to your land how much would you increase the percentage of humus?

Note.—This method is only approximately correct, because there are some volatile salts driven off by the heat, but this error is very slight. It is the simplest method.

7. Effect of Humus on the Water-Holding Capacity—

Use fine sand, coarse sand, clay and loam. Make mixtures of each type containing fifty per cent. of humus. Determine the water-holding capacity as in the former experiment on water-holding capacity of soils. Does the adding of humus increase or decrease the water-holding capacity of soils? Compare carefully with the former experiment. Can you explain the difference. Would this be of any advantage in practical farming?

8. Effect of Humus on Temperature—

Take a small flower-pot full of each type of soil just moist enough to till well. Read the temperature with the Centigrade thermometer, set in the sunshine for one hour and then again read the temperature. Note the rise in temperature and tabulate results.

Now take the same pots and make mixtures of fine and coarse sand, clay and loam with 50 per cent. of humus, also just moist enough to till well; read the temperature of the mixture and set in the sunlight as before for an hour and read again. Tabulate results. What was the effect of the humus on the temperature of the soil? Which would probably warm up first in the spring—a soil rich in humus, or one deficient in humus?

9. Effect of Color Upon Temperature—

Fill two small flower-pots with each kind of soil. Note the temperature of each carefully. Cover one pot of each kind of soil with lampblack and the other one with pulverized lime or chalk-dust, set in the sunshine for an hour and read the temperature again. Which warmed the soil most, the white or the black covering? Tabulate results. Is a soil rich in humus darker or lighter in color than one deficient in humus? Does this suggest another advantage in having plenty of humus in the soil?

10. Movement of Water in Soils (upward)—

Use each type of soil. Take the long glass tubes (one inch in diameter and five feet long), tie cheese cloth over the lower end and fill with the soil (a tube for each kind of soil), and stand in a frame upright and set the bottom in a vessel of water, and let it stand for several weeks (the water in the vessel should be kept at a constant level). Note each day (each week) the height the water has risen in each type of soil. Tabulate results. Why does the water rise in the soil? Explain fully. Explain, if you can, the cause for such wide variation in the rate of rise in the different soils. Do you see any relation between the size of the particles of soil and the rate of rise in the tubes? Let each stand until the limit is reached. Tabulate results.

11. Movement of Water in Soils (downward)—

Fill the tubes with each type of soil as before, leaving about six inches empty at the top. Set over some vessel to catch the drain water. Pour water in at the top, keeping account of how many inches are put into each tube. Note the time required for the water to drain through each tube. Take notes each day and tabulate results. Which drains through the most rapidly? Which requires the longest time to drain through? Does this explain why some soils remain muddy longer than others after a rain?

12. Effect of Dust Mulch on Soils—

Take two small flower-pots for each type of soil; moisten each type of soil so it is in good condition to till well. Fill one pot level-full of each soil; fill the other one within an inch of the top and fill the rest of the way with dust (not too fine). Weigh each set of pots carefully, and set away in an open room. Weigh every day until the weight of the pots becomes constant, then all the moisture will be gone. Tabulate results. What was the effect of the mulch? How does a mulch retard evaporation? Explain how it is possible to have a dust mulch under field conditions? How would you form a dust mulch in the field?

13. How to Get Samples of Soil from the Field—

An inch, or an inch and a quarter auger with a four-foot handle is needed, also a soil bottle for each foot of soil to be studied.

Select some place in the field under average conditions and a medium between a raised location and a depression; bore down six inches and take all the soil off of one side of the auger and put in bottle No. 1; clean the auger and bore six inches more and save the soil from one side of the auger—this is a sample of soil from the first foot of soil. (The foot and half-foot marks should be plain on the handle of the auger.) Clean the hole out with the auger, then clean the auger. Then you are ready to take a sample of the second foot, which is secured in the same way. The succeeding samples are secured in the same way as the first. Be careful to clean the hole out each time and keep the auger clean. Label the bottle carefully and stopper well, so no moisture can escape. Take to the laboratory and determine the percentage of moisture for each foot. This is done by weighing out a small amount (three or four grams) and letting dry for four or five days in the warm room. Weigh again when dried and divide the loss, or the amount of water, by the weight of the dry soil to get the percentage of moisture.

Determine the percentage of humus as in a preceding experiment.

14. Effect of Heavy Cropping—

Take samples of soil for the first three feet from a field that has been in crop continuously for a number of years and samples from virgin soil (soil not cropped which can be found in fence corners, etc.). Take to the laboratory and determine the percentage of humus; also the percentage of moisture. What has been the effect of the heavy cropping? Where do you find the largest per cent. of humus—in the first, second or third foot?

First Year. Second Semester—

RECOMMENDED MINIMUM COURSE.

1. The selection, testing and germination of seeds.

2. The vegetable garden, including the treatment of garden soils and application of fertilizers; winter and spring forcing of vegetables.

3. The planting and care of vegetables in the open ground.

SUPPLEMENTARY COURSE.

Plants; their definition, comparative importance and economic classification; the component parts of a plant and the functions of each part; the influence of ecological factors; plant diseases and their remedies.

FARM CROPS.

SUGGESTED LABORATORY EXERCISES AND FIELD EXPERIMENTS.

I.

Study two important crops—wheat and oats. Compare the two in regard to their inflorescence (arrangement of flowers or method of bearing seed). Student should become familiar with the following terms: *Rachis, rachilla, spikelet, outer* or *empty glume, inner* or *flowering glume, kernel, palet* or *palea, infertile flower, infertile spikelet.* ("Cereals in America," Hunt.) The inflorescence in wheat is called a **spike;** in oats it is called a **panicle.** Point out the difference. What is the difference in threshed "grain" between wheat and oats? Could oatmeal be made from the grain as it comes from the thresher? Why?

II.

Study these two crops in the field if possible. Study their root systems. What kind of a root-system do they have? Is this typical of all grasses? What is **stooling** or **tillering** as applied to grasses? Observe this tillering under field conditions. What effect has thickness of planting upon tillering?

III.

If a field of wheat or oats is visited find out how much seed has been sown per acre.

Measure the distance between drill rows. Measure also the average distance between plants in a row. Then in the laboratory weigh out five grams of wheat or oats and count the number of grains; from this as a basis compute the number of grains in the amount sown per acre. How near should the plants be together if every grain had grown? How does this compare with what you find under actual field conditions? Explain this difference.

IV.

Plant wheat, oats, red clover, timothy, alsike clover, alfalfa, peas, beans and squash in a box of sand or fine soil. Place some of each of these seeds at the following depths: 1-inch, 2-inch, 3-inch, 4-inch, 5-inch, and 6-inch. Observe the effect of depth of planting upon germination and growth. Should all seeds be planted at the same depth? What becomes of the seed? Do some seeds come above ground?

V.

From a quantity of wheat or oats separate the grains into two groups—large and small grains. Weigh one hundred of each and note the difference in weight. Which in your judgment are better for planting? Why? Farmers are advised to use the fanning mill freely in preparing wheat and oats for seed. Is this good practice? What is the purpose in using the fanning mill? Germinate one hundred seeds from each of the above mentioned groups and note results. Is there any difference?

VI.

Visit a field of clover or alfalfa if possible. Note the thickness of stand. Measure off one square foot and count the number of plants. Take the average of six such counts. Do you consider this a good stand? Find out how much seed was sown per acre.

In the laboratory weigh out two grams of seed and count the number. Compute from this and the amount sown per acre, the number of plants that should be on each square foot of ground. Compare this with actual numbers found. Give reasons for difference. Is it important to have good seed and a good seed bed?

VII.

Get as many different kinds of seeds as possible and plant a few of each. When they are sprouted study the seedlings. Determine for each one whether it is monocotyledonous or dicotyledonous. What becomes of the cotyledons during germination? Which seeds have endosperms and which do not?

VIII.

The collection above mentioned should include all the common grasses, grains, legumes and weeds. Determine length, breadth and thickness of each; also general shape and color. Note any and all characteristics which will help to identify them. Let each pupil make a collection of these. Use small homeopathic vials for this purpose. These vials should be neatly labeled and numbered.

IX.

Get a number of samples of alfalfa and clover seeds. Examine each for impurities. Weigh out accurately one or two grams of each and separate into its constituent parts. If there is more than one kind of weed seed present place each in a separate lot and compute percentage

of each. How much pure seed is there? If possible, identify each kind of weed seed. Make a germination test of each sample by placing one hundred seeds between two layers of moist blotting paper on a plate. This plate must be covered so as to reduce evaporation. In this way determine the best sample.

X.

From the stock of seeds on hand, the teacher should prepare mixtures of various kinds and ask the pupil to separate them and identify by means of his labeled samples. After some practice the pupil should be required to separate and identify from a more difficult mixture the various seeds without the aid of his samples.

Second Year.—First Semester—

RECOMMENDED MINIMUM COURSE.

Horticulture; the selection of orchard and garden sites as to soil, convenience, drainage, wind breaks and general adaptability.

The planting of orchards and gardens; methods of propagation, cultivation, pruning and transplanting.

SUPPLEMENTARY COURSE.

Greenhouse management; a study of the best plants to grow in greenhouses, with suitable methods of propagation, potting and heating; the construction of small greenhouses; cold frames and hot beds.

Second Year. Second Semester—

RECOMMENDED MINIMUM COURSE.

The culture of small fruits; a study of growing large fruits, including methods of tillage, spraying, picking and packing.

The principles of farm forestry.

SUPPLEMENTARY COURSE.

A study of the best methods of beautifying the farm homes at small expense, the planting of trees, shrubs, vines and decorative gardens. The improvement of rural school grounds.

EXERCISES IN HORTICULTURE AND FLORICULTURE.

The following are a few suggestions in regard to work in horticulture and floriculture, as applied to the beautifying of home and school grounds. This work may be done in connec-

tion with horticulture taught in the high school, or as separate exercises.

I. Suggestive List of Trees, Shrubs and Flowers—

1. Trees (native)—Maple, cedar, hemlock, box-elder, mountain-ash, poplar, birch, black walnut, English walnut.

2. Shrubs (native)—Willow, dogwood, elder, sumac, flowering currant, barberry, lilac, syringa, spirea, snowball.

3. Vines—Virginia creeper, Boston ivy, honeysuckle, Japanese ampelopsis, bitter-sweet, hop, moon-vine.

4. Perennials—Bleeding heart, hollyhock, goldenrod, rhododendron, wild rose, iris, bulb plants, hydrangea, rambler-rose.

5. Grasses—Ribbon-grass.

II. Features to Bear in Mind—

1. Unity—The yard, a picture frame; foreground, sky, side-planting; canvas, the greensward; central feature, house, some prominent object; background, subordination of minor features.

2. The Plan—Making the plot; location and proportion; outside features; surface features; buildings; utilization of space; walks, paths and drives; subordinate features; effect of masses; character, secured through extent; continuous features; variety of form, shade and texture.

III. Planting—

1. How to Plant—Preserve and emphasize natural growth and beauty; grouping, in nature; irregular massing; roadside borders; foundation planting; low border masses; massing, for color, for foliage and form, for cover or screen; openings for convenience, for views.

2. What to Plant—Native trees and shrubs; hardy varieties. Consider progress of season characteristics of different varieties; use flowers as incidents.

IV. Applications—

1. The House—Planning anew; remodeling the yard; screening of farm buildings; features, homelike, retired, cozy.

2. The School—Plan, new, remodeled; extent and depth; side and rear massings, one side massing; playground.

V. Some Principles—

1. Encourage natural growth; begin with fundamentals; have one emphatic central feature; keep center open; frame and mass sides; avoid scattered effects; avoid eccentricities.

VI. Necessary Features—

1. Order and simplicity; unity, harmony and variety; convenience; proportion.

Third Year. First Semester—

RECOMMENDED MINIMUM COURSE.

1. Poultry—The care and management of poultry; size and location of poultry house; the classification of poultry as to types.

2. Cattle—Their origin, history and classification as to beef types, dairy types and dual-purpose types, with the characteristics of each.

3. Horses—Their origin, history and typical characteristics of various breeds.

SUPPLEMENTARY COURSE.

Swine—Including their origin, history, characteristics and classification as to large, medium and small types, or on the basis of color and bacon-producing qualities.

Sheep—Including origin, history, general appearance, meat and wool of the various breeds.

Third Year. Second Semester—

RECOMMENDED MINIMUM COURSE.

Dairying—Including a thorough study of the dairy type of cow, her care and management; the organization and development of dairy herds; milk, its composition and prevention of contamination; the care of cream for market and butter making; the Babcock test; cream separators.

LABORATORY EXPERIMENTS.

Among those which may be performed, the following are suggested as profitable laboratory experiments in dairying. These should only be attempted by pupils who have covered the work in Soils, Crop Production and Stock Judging.

Experiment No. 1—

Milk Testing.—Use Babcock tester. Emphasize the importance of this in connection with the daily milk record as a means of selecting the profitable cows.

Reference: Chap. 18, Michels' "Dairy Farming"; "Modern Methods of Testing Milk and Milk Products," Van Slyke; "Testing Milk and Its Products," Farrington & Woll.

Experiment No. 2—

Cream Testing.—Use Babcock tester.

Reference: Same as No. 1, and "Creamery Butter Making," Michel.

Experiment No. 3—

Milk Testing for Adulterations.—Use the lactometer. Use four samples, one normal, one skimmed (add skim milk to the whole milk), one watered, and one skimmed and watered.

Reference: Same as No. 1.

Experiment No. 4—

Hand-Separating.—Test machines for efficiency with both warm milk (100 deg. F.) and cold milk (60 deg. F.). With the Babcock tester, test the whole milk, the skim milk, and the wash water. Use the skim milk to make starter to ripen cream for Experiment 5.

Reference: Each manufacturer's catalog and Michels' "Dairy Farming."

Experiment No. 5—

Churning.—Use barrel churn. Test cream for per cent. of butter fat (Exp. 2). Test the acidity of the cream with either Mann's or Farrington's test. Test the buttermilk for fat, using the Babcock test.

Reference: Michels' "Creamery Butter Making"; "Principles and Practice of Butter Making," McKay & Larsen.

Experiment No. 6—

Cheese Making.—Cottage cheese, pasteurized Neufchatel cheese and cream cheese.

Reference: "The Science and Practice of Cheese Making," Van Slyke & Publow; "Cheese Making," Decker.

SUPPLEMENTARY COURSE.

Cheese Making—The production of certified milk; the best methods of handling milk for retail and wholesale purposes.

Fourth Year. First Semester—

RECOMMENDED MINIMUM COURSE.

Farm management; including farm plans, the size and location of fields, buildings, fences and roads; the care and use of farm machinery.

SUPPLEMENTARY COURSE.

The problems of labor and capital as affecting farm life. The ownership and rental of land, and other allied economic problems.

Fourth Year. Second Semester—

RECOMMENDED MINIMUM COURSE.

The comparison of different types of farming, as grain, mixed, stock and dairy farming.

The classification of farm crops, including best methods of production, harvesting and storing.

SUPPLEMENTARY COURSE.

Farm records and accounts. The betterment of social conditions on the farm. Modern conveniences; the sanitation of the farm house.

LIST OF REFERENCE BOOKS.

The literature of this subject is voluminous and growing rapidly. The best sources of printed information, particularly for reference reading, are the bulletins, circulars, and other publications of the U. S. Department of Agriculture, Washington, D. C. The instructor should have the publication lists of the department, which may be had for the asking, and have his name on the mailing list, in order that he may receive periodical lists of new publications as they are issued. From these lists anyone can make a selection of bulletins dealing with whatever phase of agricultural study is being pursued.

Instructors in agriculture should keep in touch with the activities and publications of the State College and Experiment Station at Pullman.

From the following list of books, which is more selective than complete, it should be easy to choose a working library adapted to the needs of any high school course in agriculture:

Bailey. Principles of Agriculture. Macmillan.
Bailey. Garden Making. Macmillan.
Bailey. The Nursery Book. Macmillan.

Bessey, Bruner and Swezey. New Elementary Agriculture. The University Publishing Company, Lincoln, Neb.
Burkett, Stevens and Hill. Agriculture for Beginners. (Revised edition.) Ginn.
Chase and Davidson. Farm Machinery and Farm Motors. Judd.
Conn. Agricultural Bacteriology. Judd.
Craig. Judging Animals. Renyon Printing Co., Des Moines, Ia.
Goff. Principles of Plant Culture. Judd.
Hilgard and Osterhout. Agriculture for Schools of the Pacific Slope. Macmillan.
Hunt. Forage and Fiber Crops in America. Judd.
Hunt. The Cereals in America. Judd.
Jackson and Daugherty. Agriculture Through Laboratory and School Garden. Judd.
Jewell. Agricultural Education. U. S. Bureau of Education, Washington, D. C.
King, F. H. Physics of Agriculture. Published by the author, Madison, Wis.
Lewis. Poultry Laboratory Guide. Macmillan.
Lyon and Montgomery. Examining and Grading Grains. Published by the authors, Lincoln, Nebraska.
McCall. Physical Properties of the Soil. Judd.
McKay and Larsen. Butter Making. Wiley.
Osterhout. Experiments with Plants. Macmillan.
Reynolds. Veterinary Studies for Agricultural Students. Macmillan. (Revised edition.)
Russell. Dairy Bacteriology. Published by the author. Madison, Wis.
Shaw. Feeding Farm Animals. Judd.
Shaw. Breeds of Live Stock. Judd.
Shaw. Animal Breeding. Judd.
Smith. Profitable Stock Feeding. Published by the author, Lincoln, Nebraska.
Snyder. Soils and Fertilizers. Chemical Publishing Co., Easton, Pa.
Snyder. Dairy Chemistry. Chemical Publishing Co., Easton, Pa.
Snyder. The Chemistry of Plant and Animal Life. Chemical Publishing Co., Easton, Pa.
Stevens and Hall. Diseases of Economic Plants. Macmillan.
Stevenson and Schaub. Soil Physics Laboratory Guide. Judd.
Spillman. Grasses of the United States. Judd.
Upham. Introduction to Agriculture. Appleton.
Vivian. First Principles of Soil Fertility. Judd.
Voorhees. Fertilizers. Macmillan.
Warren. Laboratory Manual of Farm Management.
Warren. Elements of Agriculture. Macmillan.
Waugh. Landscape Gardening. Judd.
Wilson. Agriculture for Young Folks. Webb.
Wing. Milk and Its Products. Macmillan.
Woll. Modern Dairy Practice. Wiley.
Wilkinson. Practical Agriculture. American Book Co.

LIST OF REFERENCE BOOKS ON DAIRY TOPICS.

"Dairy Farming," by John Michels, Clemson College, S. C.
"Modern Methods of Testing Milk and Milk Products," Vanslyke, Orange Judd Co.
"Testing Milk and Its Products," Farrington & Woll, Mendota Book Co., Madison, Wis.
"Creamery Butter Making," Michels, The Author, Raleigh, N. C.
"Principles and Practice of Butter Making," McKay & Larsen-Wiley & Sons, N. Y.
"The Science and Practice of Cheese Making," Vanslyke & Publow; Orange Judd Co., N. Y.
"Cheese Making," Decker, The Author, Columbus, Ohio.
"Elements of Dairying," by Decker, Columbus, Ohio.
"Profitable Dairying," by Peck, Orange Judd Co.
"The Farm Dairy," Gurler, The Breeders Gazette, Chicago, Ill.
"First Lessons in Dairying," Van Norman, Orange Judd Co.
"Economics in Dairy Farming," Mathews, Country Life Library of Agriculture.
"The Book of the Dairy," Aikman & Wright, D. VanNostrand Co., N. Y.
"Analysis of Milk and Its Products," Leffman, P. Blakiston's Son & Co., Philadelphia, Pa.
"Milk, Its Nature and Composition," Aikman, A. & C. Black, London.
"Milk and Its Products," Wing, The Macmillan Co., N. Y.
"Clean Milk," Belcher, Orange Judd Co.
"Dairy Chemistry," Snyder, The Macmillan Co.
"Outlines of Dairy Bacteriology," Russell, State Journal Printing Co., Madison, Wis.
"Ice Cream and Cakes," Chas. Scribner's Sons.
"The Laboratory Book of Dairy Analysis," Richmond, J. B. Lippincott Co., Philadelphia, Pa.
"A Laboratory Hand Book for the Analyzing of Milk, Butter and Cheese," James R. Evans, Member of the Soc. of Chemical Industry.
Farmers' Bulletins: 1 06, 124, 55, 144, 190, 162, 273, 251, 22, 169, 119, 190, 202, 222, 237, 149, 317, 225, 267, 346, 337, 305, 209.

GEOLOGY.

One semester's work in geology, to be given as an optional subject in the fourth year, is suggested in the outline prepared by the State Board. Thus far, geology has been offered in only one or two high schools of the state. It should not be attempted except by a school that is equipped with a suitable museum, and so fortunate as to have an experienced teacher of the subject. These being available, the following are suggested as the minimum content of the half-year's course named by the State Board:

1. The study of a rather simple, standard text book, on the basis of which the following should be covered:

(*a*) Dynamic geology, showing the external and internal geological agencies of change.

(*b*) The structure and composition of the crust of the earth.

(*c*) A study of representative minerals, rocks and fossils.

(*d*) A survey of historical geology.

2. Field work, in which observations of geologic phenomena are made. These should be recorded in a notebook.

REFERENCE BOOKS.

In purchasing reference books in any science so technical as geology, care should be used to procure those within the mental grasp of high school pupils. Selections may be made from the following list:

Brigham, A. P. Text-Book of Geology. Appleton.
Condon, Thos. The Two Islands, and What Became of Them, an account of the geology of Oregon and the Northwest. Gill.
Dana. The Geological Story, Briefly Told. American Book Co.
Dutton. Earthquakes. Putnam.
Heilprin. The Earth and Its Story. Silver, Burdette & Co.
Martin. The Story of a Piece of Coal. Appleton.
Norton. Elements of Geology. Ginn.
Ries, Heinrich. Economic Geology of the U. S. Macmillan.

ASTRONOMY.

The outline course provides for one semester's work in astronomy, to be given as an optional subject in the twelfth grade.

The object of this course, if offered, should be to convey to the minds of the pupils some notions of how knowledge concerning sidereal phenomena is obtained. The mathematical computations required for a mastery of the subject are beyond the high school pupil. Consequently all difficult problems and formulas should be left for more advanced work. At the same time the real movements of heavenly bodies in space and resulting apparent movements on the sphere must be comprehended and correlated. Certain geometrical conceptions are absolutely necessary to any knowledge of astronomy. The pupil is sure to encounter difficulties in doing that reasoning from the apparent to the real, and from the real to the apparent, which must be done. One of the main tasks of the teacher of astronomy consists of helping the pupil to overcome these difficulties.

Either Semester—

RECOMMENDED MINIMUM COURSE.

1. The study of some text-book, in which the subject is treated in a simple, yet thoroughly scientific way.

2. A knowledge of the use of the celestial globe, star atlas, and American Ephemeris and Nautical Almanac.

3. Identifying the principal constellations. This must be done partly through observations of the sky itself.

4. Observational study of the path of the moon and apparent path of the sun.

SUPPLEMENTARY COURSE.

1. Chart on star maps the movements of planets visible while the course is in progress.

2. Observations of latitude of the home locality. These need not be exact to give the pupil the kind of information desirable.

3. Regular outside reading of current astronomical literature.

(This part of the work must necessarily be confined to the simpler, more popular class of writing. High school pupils cannot be expected to read intelligently the technical literature of the subject.)

EQUIPMENT NECESSARY.

Any school offering this work should possess some good star atlases, and a celestial globe. A few good books on the subject for reference work are indispensable. The following list is suggestive:

American Ephemeris and Nautical Almanac. Published by the Nautical Almanac, Washington, D. C.
Ball. The Story of the Heavens. Cassell.
Ball. Great Astronomers. Isbister.
Byrd. Laboratory Manual in Astronomy. Ginn.
Comstock. A Text-Book of Astronomy. Appleton.
Flammarion. Astronomical Myths. Macmillan.
Gore. The Visible Universe. Macmillan.
Gore. Flammarion's Popular Astronomy. Chatto and Windus.
Iles. The Skies and the Earth. (Little Masterpiece Series.) Doubleday.
Klein. Star Atlas. Young & Co., New York.
Langley. The New Astronomy. Houghton, Mifflin.
Lowell. Mars. Houghton, Mifflin.
Martin. The Friendly Stars. Harper.
Maunder. The Royal Observatory. Religious Tract Society, London.
Moulton. Introduction to Astronomy. Macmillan.
Newcomb. Astronomy for Everybody. McClure.
Newcomb. The Stars. Murray, London.
Orchard. Astronomy in Milton's Paradist Lost. E. E. Stechert.
Popular Astronomy. A magazine devoted to the subject, published at Northfield, Minn.
Swezey. Practical Exercises in Astronomy. Appleton.
Todd. New Astronomy. American Book Company.
Upton. Star Atlas. Ginn.
Young. Manual of Astronomy.
Young. Lessons in Astronomy.
Young. General Astronomy.

A TELESCOPE.

A small telescope with 2½-in. or 3-in. objective, mounted on a stand or tripod, will add very much to the efficiency of the course and give the students some first-hand knowledge concerning celestial objects. A suitable one may be purchased for from $60.00 to $125.00.

PHYSICS.

For two reasons physics has come to be regarded as perhaps the most nearly standard scientific subject in the entire high school course of study: (*a*) Its pedagogical adaptability, developed through long usage; (*b*) its close relation to all the common activities of life. Although the wisdom of requiring practically all the pupils to take the year's work in physics in order to complete certain standard high school courses has been the subject of much vigorous controversy, the subject is likely to retain indefinitely its important place in the program of studies.

In order to make the subject of the highest practical value in our Washington high schools, the following suggestions are offered:

1. The time spent by the teacher with the class should be about equally divided between recitation and laboratory work. If two double periods per week are given to laboratory work and three single periods to recitation and demonstration, the laboratory phase is sufficiently emphasized. If one double period is given to laboratory work and the class devotes four single periods per week to recitation, the laboratory work is apt to be skimped. To preserving the most efficient balance between these two the skill of the teacher should be employed. A class can usually learn more from a recitation conducted by a thoroughly good teacher than from a period spent in a laboratory. In other words, if a class needs a recitation more than they need a period of laboratory work they should be given the recitation, and throughout the course the aim should be to divide their time fairly equally between these two forms of class activity. Considering the demands of all classes of schools, the general opinion is in favor of large emphasis on class work.

2. The simpler the laboratory apparatus the better. No pupil should be allowed to work with laboratory apparatus the physical construction of which he does not fully understand. The result of every experiment should be to give an accurate

comprehension of the principle which it is designed to illustrate. The principles underlying the physical construction of apparatus form a part of the subject which he is studying. Apparatus that can be made, or at least assembled, by the students themselves, is greatly to be desired. It must be borne in mind, however, that while the boy who makes or assembles a given piece of appartus receives benefit, the boy who during the following year uses a poorly-made piece is harmed. It is not well to fit up a laboratory with home-made apparatus. Students may be mystified by elaborate apparatus to a degree which quite defeats the object of a laboratory course in physics. Under the teacher's direction, much simple apparatus may be made by the pupils. The thing that must be kept constantly before the minds of the pupils in such work is the scientific purpose in view. Weights and measures used in ordinary business, meters for water, gas and electricity, small engines and pulleys useful for practical purposes — all these, though simple, illustrate clearly the principles involved, are sufficiently accurate, and if used substitute for laboratory artificiality an air of realness. The use of the pieces themselves adds to the practical value of the information. All machinery and equipment now commonly found in connection with heating, lighting, bell signals, cleaning, etc., may be considered and advantageously used as a part of the physics laboratory apparatus.

3. The effort should be constantly put forth to draw illustrations of physical phenomena from the familiar occurrences of every-day life. All the work in such subjects as general physical measurement, mechanics of solids and fluids, sound, heat and light is closely connected with much of the most familiar phenomena of living.

4. The tendency to try to teach college or university physics should be avoided. The field of advanced investigation must be left to people who are qualified to work therein. One of the great objects in the teaching of science to high school pupils should be to give young people a vision of the world of scientific truth. The text-book having been chosen, it should be adhered

to religiously. High school pupils have little capacity for criticising text-books. When a teacher has learned just what material is best adapted to the capacity, interest, and education of the pupil, he has advanced far along the road to success.

5. The lecture demonstration part of physics should be very informal, with chance for questions and answers by both teachers and pupils. It should break the ground before the pupil and show him how experiments should be performed. It may be used either to introduce or to sum up a topic. Should be so conducted as to awaken interest and to present important facts and principles in a forcible manner. Never for display or *mere* entertainment. Display and entertainment may, however, sometimes be made a means to an end, *e. g.*, for emphasis or to awaken interest. The spectacular should always be used very guardedly lest the pupil be so carried away by the exhibition as to lose sight of the facts and principles which the experiment should enforce.

RECOMMENDED MINIMUM COURSE.

No attempt has been made to divide the work in physics into two semesters, mainly for the following reasons:

1. The subject is carried continuously throughout the year and one class will advantageously cover more work in one, and less work in the other semester than another class.

2. Text-books vary in their arrangement of the topics treated. Some texts emphasize certain topics more than others and in a state where county and city adoption of texts prevails it is impossible to apply an ironclad rule. It is felt that this arrangement gives a valuable degree of latitude to the instructors.

3. The following is the list of topics in physics adopted in 1902 by the North Central Association of Colleges and Secondary Schools, to which has been added the subject of the wave theory. While it is not an absolutely exhaustive list, for that particular reason it may be supplemented by the teacher in such a way as to fit his environment. The list includes those topics on which instructors are substantially agreed as being

essential to a first course in physics. All may be mastered by high school pupils:

1. Weight, center of gravity.
2. Density.
3. Parallelogram of forces.
4. Atmospheric pressure; barometer.
5. Boyle's law.
6. Pressure due to gravity in liquids with a free surface; varying depth, density, and shape of vessel.
7. Buoyancy; Archimedes' principle.
8. Pascal's law; hydraulic press.
9. Work as force times distance, and its measurement in foot-pounds and gram-centimeters.
10. Energy measured by work.
11. Law of machines; work obtained not greater than work put in; efficiency.
12. Inclined plane.
13. Pulleys, wheel and axle.
14. Measurement of moments by the product of force times arm; levers.
15. Thermometers; Fahrenheit and centigrade scales.
16. Heat quantity and its measurement in gram calories.
17. Specific heat.
18. Evaporation; heat of vaporization of water.
19. Dew point; clouds and rain.
20. Fusion and solidification; heat of fusion.
21. Heat transference by conduction and convection.
22. Qualitative description of the transfer of energy by waves.
24. Wave length and period of waves.
25. Sound originates at a vibrating body and is transmitted by waves in air.
26. Pitch and period of sound.
27. Relation between the wave length of a tone and the length of a string or organ pipe.
28. Resonance.

29. Beats.
30. Rectilinear propagation of light; pin-hole camera.
31. Reflection and its laws; image in a plane mirror.
32. Refraction and its use in lenses; the eye, the camera.
33. Prisms and dispersion.
34. Velocity of light.
35. Magnetic attractions and repulsions.
36. Field of force about a magnet.
37. The earth a magnet; compass.
38. Electricity by friction.
39. Conductors and insulators.
40. Simple galvanic cell.
41. Electrolysis; definition of the amperes.
42. Heating effects; resistance; definition of the ohm.
43. Ohm's law; definition of the volt.
44. Magnetic field about a current; electromagnets.
45. Electromagnetic induction.
46. Simple alternatic current dynamo of one loop.
47. Electromagnetic induction by breaking a circuit; primary and secondary.
48. Conservation of energy.
49. Wave theory.

SOME SUGGESTIONS AS TO THE PRACTICAL APPLICATION OF PHYSICS.

The following is a list of suggestive applications of physical principles to matters with which the pupils are familiar, in agriculture, manufacturing, household economy, etc.

Uses of guy wires; influence of weight of draft horses.

Effect upon hauling of size of wheel; of condition of road; of steep grades.

Atmospheric pressure and pumping; breathing; milking machines; soil breathing.

Balloon; airships, aeroplanes.

Laundry drier; cream separator; steam engine governor; banking of railway curves.

Capillary action in lampwick; in a sponge; in the soil; in plants.

Levers; whippletree; platform scales; two, three and four-horse evener; the bones of the body; the claw hammer; the scissors; the crowbar.

The windlass; the bicycle; the treadmill; the use of belting; gears; capstans; horse-power sweeps.

Recoil of guns.

The wedge; the jack screw; the screw press; the bench vise; the plow.

The hydrometer; the lactometer.

Osmosis in plant and animal membranes.

The pneumatic tire.

Lubrication; ball bearings; the "hot box."

Methods of heating and ventilating buildings.

Heat of vaporization; cooling effect of perspiration; of sprinkled floors; of evaporating liquids. Ammonia ice plant.

The use of non-conductors of heat in tea pot handles, pokers, flatirons, etc.

Clothing—transference of heat.

Electricity; power houses; telephone systems.

LABORATORY EUIPMENT.

The laboratory should be well lighted, and furnished with a sufficient number of good solid tables to accommodate the class. Running water and gas are highly desirable, though by no means indispensable. Shutters for darkening the windows are useful accessories; they can easily be made by fastening some black building paper over frames of the right size.

The following list of apparatus is fairly complete, represents a working equipment for an accredited high school where there are ten pupils in the class, and may easily be supplemented by the suggestions of a wideawake instructor:

For work in general physical measurement—

Meter sticks sufficient to supply class.
Graduated glass cylinder, 500-cc.
Graduated glass cylinder, 100-cc.
Graduate English measure.
Set English measures.
Set liter measures.

Balance.
Horn pan balance, 6-in.
Harvard trip balance.
Spring balance, 30-lb., 15-kg.
Nine spring balances, 2000-g. by 25-g.
Set universal iron weights with hooks, 10-g. to 1-kg.
Set brass weights in block, 100 grams to 1 centigram.
Set avoirdupois weights, 1-oz. to 2-lbs., with hooks.
Four iron supports.
Iron tripod.

For work in mechanics of solids—

Set pulleys—1 fixed single, 1 movable single, 1 each double, 1 triple.
Wheel and axle.
Iron ball 4 inches in diameter, with hook.
Two small brass balls with hooks, to use for experiments with pendulum.

For work in mechanics of fluids—

Universal hydrometer, that is, one that may be used for liquids either lighter or heavier than water. If preferable in the judgment of the instructor, two hydrometers, one for heavy and one for light liquids, may be substituted.
Boyle's law tube.
Set capillary tubes.
Air pump.
Barometer tube.
Pascal's vases.

For work in sound—

Sonometer or violin.
Several tuning forks of different pitch.
Tall glass cylinder without lip, 50-cm. or more high.
Whirling machine.
Savart wheel for whirling machine, 4 rows holes.
One pair heavy mounted sympathetic forks.
Cello bow for Chladni's plate.

For work in heat—

Thermometer, 3 scale.
Two chemical thermometers, double scale.
Glass bulb, about 100-cc., with long stem for use as air thermometer and for study of liquid and gas expansion, etc.
Double or water bath boiler.
Ball and ring for studying expansion of solids.
Pulse glass.

For work in light—

Lamp.
Concave and convex mirror.
Set lenses.
Glass prism.
Color tops.

For work in electricity and magnetism—

Glass rod, rubber rod, catskin, and pieces of flannel and silk cloth.
Electrophorus.
Insulated conductor.
Leyden jar.
Demonstration voltaic cell.
Several dry cells.
Bar magnets in box.
Horseshoe magnet.
Electro magnet.
Primary and secondary coil.
Induction coil, ¼ inch spark, sliding coil.
D'Arsonval galvanometer, cheap form.
Magnetic compass.
Resistance box, 1 to 100 ohms (cheap form).

The following are some of the pieces which may be added as soon as circumstances will permit:

Model steam engine.
Electric bell.
Telephone.
Telegraph.
Dynamo, motor, etc.

In addition to the above there should be the equipment of ordinary supplies of glass and rubber tubing, plain and insulated wire of different sizes, corks, mercury, sheet rubber, etc., and a few tools, such as pincers, hammer, saw, plane, stock and bits, etc.

TEXT-BOOKS, WORKS OF REFERENCE, AND LABORATORY MANUALS.

Abbott. Light. Harper.....$1 50
Atkinson. Electricity for Everybody. Century..... 1 50
Adams. Physics for Secondary Schools. American Book Co... ....
Adams. Harper's Machinery Book for Boys. Harper..... 1 75
Adams. Laboratory Manual. American Book Co..... ....
Benjamin. Age of Electricity. Scribners..... 2 00
Bonney. Induction Coils. Macmillan..... 1 00
Boys. Soap Bubbles. Young..... 75

Bottome. Electrical Instrument Making for Amateurs. Van Nostrand $0 50
Bolton. The Evolution of the Thermometer. Chemical Pub. Co. 1 00
Buckley. Short History of Natural Science. Appleton..... 2 00
Cajori. History of Physics. Macmillan..... 2 00
Carhart. Primary Batteries. Allyn & Bacon..... 1 50
Carhart and Chute. High School Physics. Allyn & Bacon..... ....
Chute. Physical Laboratory Manual. Allyn and Bacon..... ....
Coleman. Elements of Physics. Heath..... ....
Coleman. Physical Laboratory Manual. Heath..... ....
Crew. Elements of Physics. Macmillan..... ....
Crew and Tatnall. Laboratory Manual. Macmillan..... ....
Curiosities of Light and Sight. Swan, Sonnenschein..... 1 00
Culler. Text-Book of Physics. Lippincott..... ....
Dolbear. Matter, Ether and Motion. Lee & Shepard..... 1 00
Duncan. The New Knowledge. A. S. Barnes & Co..... 2 00
Ganot. Physics. Wm. Wood & Co..... ....
Garnett. Heroes of Science. (Physicists) Young..... 1 00
Gorton. High School Course in Physics. Appleton..... 1 25
Hampson. Radium Explained. (Practical Science Series) Dodd. ....
Iles. Invention and Discovery. Doubleday..... 75
Hubert. Inventors. Scribners..... 1 50
Hopkins. Experimental Science. Munn & Co..... 5 00
Jackson and Jackson. Elementary Book on Electricity and Magnetism. Macmillan 1 40
Lodge. Pioneers of Science. Macmillan..... ....
McMullen. Forty Lessons in Physics. Holt..... ....
Mann and Twiss. Physics. Scott, Foresman & Co..... ....
Mendenhall. A Century of Electricity. Houghton, Mifflin..... 1 25
Milliken & Gale. First Course in Physics. Ginn..... ....
Milliken & Gale. A Laboratory Course in Physics. Ginn & Co.. ....
Mowry. American Inventions and Inventors. Silver, Burdette & Co. ....
Mumper. Text-Book of Physics. American Book Co..... ....
Nicholls, Smith & Turton. Manual of Experimental Physics. Ginn ....
Perry. Spinning Tops. Young..... 2 00
Risteen. Molecules and Molecular Theory. Ginn..... 2 00
Rotch. Sounding the Ocean of Air..... ....
St. John. How Two Boys Made Their Own Electrical Apparatus. St. John ....
School Science and Mathematics. A monthly magazine, published in Chicago ....
Santos-Dumont. My Air-Ships. Century Co..... ....
Smith & Hall. The Teaching of Chemistry and Physics. Longmans ....
Stewart. The Conservation of Energy. Appleton..... 1 50
Thompson. Light, Visible and Invisible. Macmillan..... 1 50

Thompson. Elementary Lessons in Electricity and Magnetism. Macmillan ....
Thurston. Heat as a Form of Energy. Houghton and Mifflin.. 1 25
Tidy. The Story of a Tinder Box..... ....
Thompson. Lectures on the Electro-Magnet. Johnson..... 1 00
Twiss. Laboratory Experiments in Physics. Scott, Foresman & Co. ....
Tyndall. Sound. Appleton 2 00
Tyndall. Heat as a Mode of Motion. Appleton..... ....
Watson. Text-Book of Physics. Longmans..... 3 00
Treadwell. The Storage Battery. Macmillan..... 1 75
Whitham. Recent Development of Physical Science. Blakiston. ....
Wright. Children's Stories of Great Scientists. Scribners..... 1 25
Woodhull. Homemade Apparatus. Barnes..... ....
Zahn. Sound and Music. McClurg..... 3 50

MANUFACTURERS OF PHYSICAL APPARATUS.

The progressive instructor in physics should keep in touch with the manufacturers of physical apparatus and laboratory equipment. The catalogs of such houses should be kept on file, and may often be referred to for incidental information concerning various experiments. The following list is only suggestive:

Bausch & Lomb Optical Co., Rochester, N. Y.
Central Scientific Co., Chicago, Ill.
Columbia School Supply Co., Indianapolis, Ind.
Denver Fire Clay Company, Denver, Colo.
Eberbach & Son Co., Ann Arbor, Mich.
Eimer and Amend, New York.
Wm. Gaertner & Co., Chicago, Ill.
H. Heil Chemical Co., St. Louis, Mo.
L. E. Knott Apparatus Co., Boston, Mass.
Leeds and Northrup Co., Philadelphia, Pa
The Scientific Shop, Chicago, Ill.
C. H. Stoelting & Co., Chicago, Ill.
A. H. Thomas Co., Philadelphia, Pa.

BOOKKEEPING.

Two years' work in this subject, given in the second and third years of the high school course, requiring two periods daily throughout the year, are provided for.

General Suggestions—

1. Try to avoid mere memory work. Aim to habituate the pupil to independent thinking. Each new exercise should familiarize the pupil with the application of a new principle, and review those already established. There is a vital, practical reason for each step. To make these reasons clear, discouraging memorizing only, should be a prime object in the mind of the instructor.

2. Give short review sets frequently. In doing so set proper time limits. In this way the necessity for rapid, accurate execution is emphasized. The accountant who can be relied upon in the matter of rapid execution is the one whose services are in demand.

3. Do not be afraid to take a little time frequently, especially in the earlier stages of the work, for oral and written drills. For instance, drills on closing up ledgers should be frequently given, whether the text calls for them or not. In the long run, time will be economized in this way, and the all-to-be-desired readiness and dispatch in executing work may only thus be acquired.

4. Give additional oral practice on each arithmetical problem encountered. Keep before the pupil the fact that he will be constantly required to do this kind of work in actual business practice.

5. The practice of copying work from trial sheets into the regular blanks should not be permitted. Keep all bank pass books properly written up. This may be done by the teacher or by some pupil designated by him, but in no case allow a pupil to write up his own pass book. No bank allows a customer to do so.

6. The use of business English must be practical. The statements in connection with each original entry must be clear, concise, incapable of being misunderstood. Constantly apply this test: Would a stranger fully understand from the record just what was done?

7. Always thoroughly explain and illustrate distinctions between terms which sound similar, such as "resources and liabilities" and "assets and liabilities," "interest and discount" and "merchandise discount," etc. Familiarize the pupils with business usage in such matters.

8. As a means of lessening the chance of making mistakes in posting, it is recommended that the practice of posting all debits first and then all credits be adopted. Give most attention to reliable methods of posting and locating errors in the trial balance, as a means of promoting accuracy and economizing time. Insist on the use of folio numbers in all posting, and of a standard system of check marks when posting is reviewed.

9. Finally, and of the highest importance, insist on absolute neatness, and the best penmanship of which the pupil is capable. The course in bookkeeping is also one in applied penmanship, which should show progress from week to week.

RECOMMENDED MINIMUM COURSE.

First Year—

1. Explain and illustrate fully the theory of accounting, by showing:

(a) The origin and nature of business records.

(b) The principles of debit and credit entries.

(c) The use of the journal, cash book, ledger, check book, and bank book.

2. Practical business transactions, to illustrate the use of:

(a) Orders including definition, uses, kinds of systems of checking and filing.

(b) Bills and invoices.

(c) Receipts.

(d) Statements.

(e) Checks.

(f) Notes.

SUPPLEMENTARY WORK.

1. Special work covering less common uses of business forms, as:

(a) Receipts in full of all demands, use and validity of canceled checks as receipts, etc.

(b) Reconciling, checking and balancing bank pass books, certified and cashier's checks, etc.

(c) The practice of issuing new notes to take the place of old ones, etc.

2. Drafts of all kinds, their endorsement, form of check for the purchase of bank drafts, etc.

3. Additional business forms, such as freight receipts, bill of lading with sight draft attached, inventories, power of attorney, simple partnership agreements, etc.

ADVANCED BOOKKEEPING.

General Suggestions—

1. No pupil should be permitted to take this course unless he has successfully completed the first year's work in bookkeeping.

2. The instructor's judgment must be relied on to select as many special bookkeeping sets as are necessary properly to present the principles of advanced bookkeeping.

3. Aim at thoroughness rather than to see how many sets the pupil can write up. One set thoroughly well done, made to balance properly and complete in all details will do more to establish the principles of its execution in the mind of the pupil than three or four completed in an indifferent manner. Such problems in accounting as the opening entries showing that a business is being started by individuals, partnerships, corporations with assets and liabilities, should be given as class exercises. Practice in this work should be continued until the pupils have mastered all such entries.

4. Give frequent drills in making abstracts from auxiliary ledgers, and special exercises showing the relation between the main and auxiliary ledgers. In this way the relation of these books in the sets may best be established.

5. Aim above all things to develop in pupils the ability to retain and readily apply the principles learned. This may

require the elimination of some part of the text in order to get sufficient time for class drills on important points. The texts must be subordinate to the practical needs of the pupil.

RECOMMENDED MINIMUM COURSE.

1. Review thoroughly by class drill and blackboard, or desk work, the fundamental principles of bookkeeping as learned in the first year of the course.

2. The following books should be used in addition to the books of original entry already learned:

Sales book, bill book, invoice book, and special books of original entry peculiar to certain lines of business, such as shipping, consignment sales, voucher records, special column cash books, etc.

3. Devote some practice and drill to instructing the pupil in the work of changing sets of books from single to double entry.

4. Master the principles and application of a representative voucher system.

5. Give drill to show saving of time and labor in the modern keeping of accounts by the use of special column books of original entry.

6. Give the pupil a working knowledge of the subsidiary ledgers, which articulate through the particular accounts with the main ledger. This applies particularly to the sales, purchase, consignment and shipment ledgers.

SUPPLEMENTARY WORK.

1. Take up loose leaf and card systems and emphasize their flexibility.

2. Give extended instructions in duplicate billing. Teach its application to various kinds of accounts.

3. Make a thorough study of proprietors' capital and private accounts.

4. Make special study of such accounts as capital stock, subscription, treasury stock, unissued stock, bonds, reserve, undivided surplus, etc.

REFERENCE PUBLICATIONS.

No attempt will be made to give a list of the bookkeeping text-books and sets now on the market. Good text-books on the subject are published by all the leading publishing houses, any one of which will be glad to give full information concerning its publications.

Among the periodicals dealing with the subject, the following may be suggested as useful to both teachers and pupils:

The Business Monthly Magazine, Peoria, Ill.
Business and the Bookkeeper, Detroit, Mich.
The Business Educator, Columbus, Ohio.

PENMANSHIP.

In the high school course of study one semester's work in penmanship, five periods per week, is offered in the first year of the commercial course.

The aim of this work should be to give the high school pupil the ability to use a good, legible business hand in writing ordinary business communications, and making entries in journals, ledgers, etc. While the typewriter has come into such general use, the desirability of being able to write a good business hand has not decreased. Business men judge the fitness of young applicants as much by their ability to write well as by any single qualification. The ability to write a letter of application that is good from every standpoint is indispensable.

Suggestions for the Course—

1. Pay attention at the outset to securing good writing materials, pens and penholders, ink and paper. Pupils should be thoroughly instructed in the selection of the best materials. Too few young people know good material from poor.

2. Give thorough instruction in the matter of correct position, method of holding the pen, sitting upright, etc.

3. Do not use a copy-book. The instructor should be qualified to write good copies on the board. Use loose sheets of paper, either ruled or unruled, as the nature of the exercise may demand.

4. Lay emphasis first on the development of proper and facile muscular action; second, on the form of the letters; third, on speed. When a pupil has mastered the muscular movement the other things will come much more easily.

5. In this course each pupil should be required to practice systematically outside of class at least one hour each day, and

hand in the result of his practice. The five weekly periods are not sufficient to make a full course. This is the pupil's one opportunity to master handwriting by systematic study and practice in the subject. He should be required and encouraged to improve it to the highest degree.

6. Have each lesson definitely planned before attempting to teach it. Emphasize the fact that proficiency in penmanship requires a combination of mental and muscular effort. Encourage the study of form, self-criticism, kindly criticism of each other's work by the pupils, and individuality.

7. Give much attention, especially in the advanced part of the course, to page work, using dictated matter for speed and facility, and original composition to develop the habit of writing well at the time. The pupil may be trained to write everything he writes well—the highest object of such a course. The pupil who is taking this subject should put what he learns in penmanship into practice in the subject of English composition, which is another branch of the same course. For him to be allowed to write his English composition illegibly when he is being taught to be a proficient penman is farcical.

8. Leave the matter of fancy lettering to a subordinate place. The pupil will have few occasions to use fancy letters, will practically never be face to face with a situation that really demands a proficiency in their use.

A FEW PENMANSHIP JOURNALS.

The list of periodical publications devoted, wholly or in part, to penmanship is a long one. Many of these are extremely helpful, and one or two should be on the teacher's desk regularly. The following are suggested (there are others just as good):

The Business Educator. Zaner and Bloser, Columbus, Ohio.

The Penman's Art Journal. 229 Broadway, New York.

The American Penman. A. N. Palmer Co., Cedar Rapids, Ia.

SHORTHAND AND TYPEWRITING.

The outline course of study provides two years' work in this subject, given in the eleventh and twelfth grades. In this course, so dependent on the system and the individual method, it is impossible here to do more than outline the object to be sought. Each standard system has its own text-books, dictation exercises, exercise books, and the instructor is expected to be familiar with those pertaining to his own system and to follow them. Such details as the use of pen and ink or pencil, kind of note-book, etc., are left entirely to the judgment and individual preference of the instructor.

FIRST YEAR'S WORK.

1. Insist on the ability to use good English. This qualification is, in practice, second only to the ability to take notes that can be transcribed. Pupils having a marked deficiency in this respect may well be discouraged from attempting to learn stenography and typewriting.

2. Emphasize the necessity of thoroughness. Teach the pupils first to learn to make uniform, reliable, legible characters, and then let speed come as a result of intelligent, persistent practice.

3. Vary the instruction as much as may be done without sacrificing thoroughness. Begin simple dictation early in the course, using only those words which may be properly written with the characters and principles already learned.

4. As the work progresses emphasize the fluent reading of shorthand outlines. This is equally important with the ability to write words in shorthand.

5. Give thorough training in the care, use and construction of representative machines; also in methods of copying, manifolding, filing and indexing, briefing, backing and tabulating.

6. All matter selected for typewriting practice should be carefully edited. This subject requires the best pedagogical efforts of the instructor. The idea that pupils may learn type-

writing in an acceptable way by "picking it up" was exploded long ago.

7. Take particular care, especially during the early stages of the course, to see that pupils form correct habits of fingering. The pupil should learn to use all three leading types of machines; single keyboard, blind and visible, and the double keyboard. He should by all means, however, master one type first.

8. Touch typewriting must be taught if the pupil is to become expert. For this reason the greatest care should be taken to get pupils started right.

9. At the end of the first year, the pupil should be able to take any ordinary business dictation at the rate of 70 words per minute, and to copy on the typewriter ordinary unfamiliar business matter at a minimum speed of 25 words per minute.

SECOND YEAR'S WORK.

1. The aim of the second year in this work should be to turn out a finished stenographer. Unless the pupil at the end of the second year possesses accuracy and speed in a high degree, no credit should be given.

2. Give ceaseless attention to practice in the reading of shorthand notes. This is the only way to acquire facility in transcribing.

3. In the development of speed remember that it is far more effective to practice writing one letter many times than to write many letters once only. The pupil must learn to be absolutely sure of his characters, to know those of shorthand as well as he knows those of longhand,—a knowledge that can only be acquired through ceaseless repetition.

4. In selecting dictation material for students the instructor should aim to accomplish four things: (a) To enlarge the pupil's vocabulary and ability to use good English; (b) to increase his shorthand vocabulary; (c) to cultivate a clear and concise style of expression; (d) to train him in the best business usages through frequent drills, using material calculated to give him right ideas of business.

5. All matter dictated should be carefully selected and edited. The work thus becomes a means of teaching much valuable information, and of fixing the rules and principles of good English, punctuation, paragraphing, spelling, etc. The stenographer who has thoroughly mastered these phases of his work is more in demand than any other.

6. Require each pupil to keep a "correction book" in which he must copy and correct all his errors, and practice on corrected forms until all danger of making the same mistake again is eliminated. The underlying principles of the system should be constantly reviewed.

7. Among other things, the training in typewriting should include usages and customs regarding margins, carbon work, legal forms, invoicing, stencil and card work. A considerable amount of time should be given to speed practice.

8. At the end of the second year, the pupil's typewriting should be *perfect*, from every point of view. He should be able to write ordinary unfamiliar business dictation at the rate of 600 words per five minutes, and transcribe his notes at the rate of 35 words per minute. He should also be able to write readily any representative selection of literary matter, not more than 300 words in length, and transcribe it on a typewriter in fifteen minutes readily.

COMMERCIAL ENGLISH.

The outline commercial course of study provides for four years of English. At least one year of this work should be devoted to business English. The course in this subject should be given not earlier than in the eleventh grade. It may be found advisable to combine the work in commercial English with training in advertising, devoting three-fifths of the time to the former, and two-fifths to the latter.

Whether this plan be followed or not, or whether any attempt is made to teach advertising, the need for thorough training in writing good business English is manifest. In no way can the efficiency of graduates from commercial courses in our high schools be more effectively raised than by sending them out

equipped with a mastery of the direct, forceful, convincing English of business practice.

General Suggestions—

1. A study of this subject is intended to equip one with the ability to write creditable business letters—not only how to transact business by letter—but also how to write *business building* letters, that will get business for a firm and at the same time build the business into a larger one.

2. One of the first things necessary is to make a study of the fundamental principles involved in managing and building up a business. It is advisable to make a close study of *business building*, so as to get the proper viewpoint when writing the letter. Examine into methods used by the most prominent firms in your city and other large cities, methods in advertising, the sales force, delivery service, the attitude of the public towards the firm, and the reasons therefor.

RECOMMENDED MINIMUM COURSE.

1. At the beginning of the course some time should be given to the subject of advertising as applied to newspapers and magazines. Emphasize the advertising value of a well-worded letter.

2. The next subject that should receive attention is the elements of *salesmanship*. Discuss salesmanship from the viewpoint of the firm, the advertising value of good salesmanship.

3. Some time should be devoted to showing salesmanship as applied to letter writing—how every letter is a selling letter, whether it be a complaint letter, a collection letter, or a letter asking for an agent to sell wagons. Eighty-five per cent. of the business done in the United States is done by means of the personal letter.

4. The business letter as the personal representative. Show how the letter really represents the firm in a personal manner. Great mail order houses are able to exist by means of salesmanship applied to letter writing. Circular letters are used in every modern business as an aid to the regular advertising campaign.

The best selling houses are those which apply intelligently the science of salesmanship to their letters.

5. Study of the business letter. Show the fundamentals of the letter; how it goes through the same process as the science of salesmanship; how it is necessary to gain attention in the first paragraph; to arouse interest; to create desire for the thing you are trying to sell; to give additional argument if need be; to use persuasive reasoning; and finally to close the letter by a strong clincher to complete action. These are the fundamentals of every letter. Show how they may not be in the same order every time—but they are there in some order. It is comparatively easy to secure from the local merchants a few dozen or hundred letters for class use, for the purpose of illustration and first-hand study of letters. This kind of work will arouse a keener interest in letter writing than any other thing could do.

6. Mechanical make-up. Give special attention to details, margins, outlines, paragraphing, opening and closing, folding, addressing envelopes, kind and quality of paper—and illustrate how each of these has an advertising value in the letter and therefore an advertising value for the firm. Illustrate the preparation, keying, mailing and checking up of circular follow-up letters. Illustrate the mimeograph letter and show its value—illustrate the circular letter. Show the value of booklists, brochures, circulars and advertising to be sent in connection with letters, either as enclosures or under separate cover.

7. The letter of application. This should receive special attention because it is the kind of letter that every man and woman who enters business life will need to know how to write some time or other. Illustrate letters of complaint and collection letters; illustrate letters ordering merchandise; letters asking for freight or transportation of any kind. Social correspondence has no place in a study of this kind.

8. Office routine. Study the care of correspondence, its receipt, stamping, answering, filing, duplicate copies, general office practice among stenographers. Illustrate filing. It is

well to call attention to the file devoted to a small business and also to the numerical file that would care for the business of the largest concerns.

9. How to acquire a good working vocabulary. It is impossible for one to write a clear-cut, vigorous, aggressive sales letter unless he has a very complete working vocabulary. To acquire this working vocabulary one needs to be a good speller; and if the students are not good spellers the subject should be taken up as a part and parcel of the work in Commercial English. Show how one may increase his working vocabulary (1) by reading at least one of the daily newspapers regularly and faithfully—read the editorials; (2) a close study of at least five standard magazines of the country; (3) the habit of marking every word whose meaning is not clear and after finishing the article to refer to the dictionary for its meaning; (4) by a close study of the advertising of the metropolitan stores.

COMMERCIAL ARITHMETIC.

One semester's work in this branch is scheduled for the second semester of the first year in high school. While it will be necessary in this course for the teacher to be guided by the textbook and his own good judgment the following suggestions regarding the course are offered:

RECOMMENDED MINIMUM COURSE.

1. Only those methods approved by the best business usage may be adopted. Absolute accuracy must be insisted upon, being the standard set by all good business men.

2. The handling of such arithmetical problems as are likely to come into use of the pupil in his first business position is the chief aim of the course. With this fact in mind, lay particular emphasis on the following:

(a) Fractions, using only fractions that are possible when handling the standard weights and measures of commerce.

(b) Denominate numbers, with especial attention to commonly used tables.

(c) Percentage, as applied to business transactions.

3. Give regular daily training in rapid calculations, making accuracy a primary aim and speed a secondary aim. Teach only such shortcuts as are of practical value. Urge pupils to bring to class problems in the computations arising in daily life as much as possible.

4. Give considerable attention to mental arithmetic. Remember that the young salesman or bookkeeper will be called upon to make many a rapid mental calculation and his ability to hold his position may depend on his facility in doing this class of work.

COMMERCIAL GEOGRAPHY.

This branch being taught in the first semester of the first year of the commercial course the instruction must be adapted to the needs of the ninth grade pupil. A number of good textbooks are available and the material in the one selected should be supplemented by frequent reference to suitable maps.

RECOMMENDED MINIMUM COURSE.

1. Give a brief review of mathematical, physical and political geography until the pupils can give, in a general way, the location, physical features, approximate size, population, form of government, and language of the important commercial countries of the world.

2. The object being to acquaint the pupils with present industrial and trade conditions of the United States and foreign countries, the first material should be that which is near at hand.

3. Take up local occupations, classification of local industries, manufacturing, mechanical, transportation, financial and service industries.

4. While the text must be followed, one feature which should be kept prominently in mind, throughout the course, is the relation of the environment of Washington pupils to conditions elsewhere in the world.

SUPPLEMENTARY COURSE.

1. Take up some such subject as lumbering, wheat-raising, fishing, fruit-growing, etc., in Washington, and have individual pupils make thorough studies of the subjects and hand in written reports. These should include, the localities where the particular industry is prominent; its influence on the community; the degree to which the supply is near or remote; demand, etc. For instance, the shipment of apples from apple-growing districts in this state to Europe and Australia has an important significance in commercial geography.

2. Teach pupils the use of government and state reports. Monthly summaries of commerce and consular reports may be obtained through your representative at congress.

COMMERCIAL LAW.

One semester's work in commercial law is given in the second half of the fourth year. This work should enable the pupil when he graduates to have a thorough knowledge of the principles of commercial law, sufficient to enable him ordinarily to get along without seeking a lawyer's advice, and also to know when the services of a competent lawyer are required. He cannot conduct any business without the use of contracts, and should know the principles of law covering ordinary contractual relations. He should be able to write out for himself the simpler written agreements which his business will require. The following suggestions regarding the course are offered:

RECOMMENDED MINIMUM COURSE.

1. A good text-book having been selected, a case book on each subject mentioned should be in the reference library. The instructor should read widely, concerning the topics included, and should cultivate the acquaintance of a good lawyer, who may be appealed to occasionally.

2. Pupils often know more law than they can express. This is due to insufficient opportunity to practice the art of expression; hence, pupils should be encouraged to recite even though there are inaccuracies to be corrected. The instructor should endeavor to *teach* much and to *tell* little.

3. It will be found of advantage to spend part of the recitation time daily in giving the pupil a foreword regarding the

next day's assignment. Emphasize points of special importance. The mastery of leading principles should be aimed at, rather than the memorization of the words of the text.

4. Give frequent written tests for the purpose of fixing in mind the leading principles. Use cases cited in these written tests to make sure that the pupil can apply the principles he has learned.

MANUAL TRAINING.

General Suggestions—

1. It must be borne in mind that, owing to the fact that industrial education is in an experimental stage, it is impossible to lay down a rigid outline. In fact, the State Department believes that the widest latitude should be given to instructors to apply their own individuality in giving this course, so as to make it adapted to the needs of each particular class. In the preparation of the course a number of the most successful instructors in manual training in the state have been consulted. The course as outlined represents their combined best judgment.

2. Manual training should deal with complete processes and objects. The aim should be to enable the pupils to acquire skill gradually, through constantly making objects that are serviceable. For this reason we do not favor the introduction of set courses of models. A pupil might just as well learn to pronounce and define all of the words in the language before using them in sentences, as to master the making of a set of joints and exercises before he attempts to apply them to the making of useful objects. The fact that a botched joint may spoil a whole piece of furniture is in itself educative in the highest degree.

3. The following aims and purposes of manual training should be kept in mind:

(a) The development of "industrial intelligence."

(b) The acquisition of a sense of responsibility toward the work in hand and of pleasure in doing it.

(c) The growth of a self-reliant spirit through acquired ability to do something worth while.

(d) An appreciation of the dignity of labor.

(e) Acquired judgment to be applied in selecting a future trade through a right attitude toward industry.

(f) Some idea of the relative value of labor and material in finished products.

(g) An appreciation of the value of skill and intelligence in labor.

4. The course in manual training should not be uniform for all schools. It should be modified so as to be in keeping with the industries of the neighborhood, and the probable needs of the pupils. In many respects courses designed for city and country schools may differ widely. Each should lead, through its immediate environment, out to industrial efficiency. The number of pieces of work that may be performed is practically unlimited, and the ingenuity and personality of the instructor are appealed to in order that the most practical course may be offered in any given case.

5. It is recommended very strongly that if possible the course should include a half-year of industrial history, designed for pupils in agriculture and domestic economy. The course in economics outlined elsewhere in the manual may well be modified toward this end.

6. Much emphasis should be laid on the study of the sources of power—steam, electricity, etc. In this respect the work may well correlate with physics in the study of mechanics. A study of the development, transmission and application of power, in so far as available equipment and the capacity of the pupils will permit, is desirable.

7. The instructor should encourage the use of simple equipment, and the development of "shop spirit" pride among the boys; school citizenship with all that it implies. Manual training, if well taught, can be made a most fruitful means of the symmetrical development of the boy's personality.

SHOP WORK IN MANUAL TRAINING.

Ninth Grade. First Semester—

RECOMMENDED MINIMUM COURSE.

1. The work of this semester should cover first, work involving the application of the elementary exercises and joints, in order to familiarize pupils with the use of tools and materials, and later, the problems of assembling.

2. Principles and processes to be taught. How to plan and lay out work; the use and care of bench tools, and such supplies as sandpaper, glue, oil, paints, etc.; gluing, planing thin pieces; chamfering, making a dado joint; the setting of hinges; the use of the gauge; finishing wood with wax, oil, or shellac; French polish.

3. Suggested exercises. One involving the use of the plane, saw and chisel; the making of a half-lap joint; the making of a teapot stand, glove or handkerchief box, or inkstand.

CORRELATED AND SUPPLEMENTARY WORK.

Instruction in the development, manufacture and care of bench tools; points to be remembered in purchasing tools; the history and manufacture of glue, shellac, nails, screws, sandpaper, varnish, stains, etc.

Ninth Grade. Second Semester—

RECOMMENDED MINIMUM COURSE.

1. The work of this semester involves problems of simple carpentry and general construction.

2. Principles and processes to be taught. The use of the framing square; group work; hopper, miter and mortise and tenon joints; the making of a miter box; thin gluing, thread cutting and varnishing; the construction of a panel.

3. Suggested exercises. House framing; the building of a model house to scale, frame complete, with floor laid and cornices and door and window frames made and fitted; the making of tee square, hand clamp, knife tray, foot stool, etc.

CORRELATED AND SUPPLEMENTARY WORK.

1. The study of the framing square; such problems of house construction as plumbing, heating, ventilation, city building codes, etc.

2. Shop and factory methods; jigs.

3. Lumbering; forestry; milling; grading, inspecting and measuring of lumber.

Tenth Grade. First Semester—

RECOMMENDED MINIMUM COURSE.

1. Attention should be paid in this semester's work to problems of wood-turning, spindle work, face plate and chuck work.

2. Principles and processes to be taught. The care and use of lathe and tools; lathe finishing and polishing; accurate turning and fitting; built-up work.

3. Suggested exercises. The making of straight, step and taper cylinders; parting; grooves, beads and compound curves; the making of such objects as file handle, mallet, rolling pin, cups, bowls, card trays, covered boxes, towel ring and spheres.

CORRELATED AND SUPPLEMENTARY WORK.

1. The history, construction and principles of operation of the lathe.

2. Problems of power transmission; the conservation of energy; speed determination; belts and belting.

3. Commercial application of turning; factory method; automatic turning machinery; wood-turning machinery.

PATTERN MAKING.

Tenth Grade. First Semester—

RECOMMENDED MINIMUM COURSE.

NOTE.—This course may be substituted for the one outlined above for the first semester of the tenth grade, at the option of the instructor. It is left with the instructor and principal of the high school to determine whether, in view of the circumstances and surroundings, it is wiser to give the course in pattern making or that outlined above, to be guided by their own best judgment.

1. Principles and processes to be taught. Draft; shrinkage; finishing strips and cores; parting; filets.

2. Suggested exercises. Solid patterns, including face plate, hexagon nut and bracket; split pattern, including pipe fitting

and lathe crank; dry sand core work; pipe fitting; green sand core work, including the making of a wrench, pulley, etc.

CORRELATED AND SUPPLEMENTARY WORK.

1 The study of larger problems of moulding in all branches.
2. Metallurgy, and casting of iron, brass and steel.
3. Study of foundry work, including supplies, tools and materials.

Tenth Grade. Second Semester—

RECOMMENDED MINIMUM COURSE.

1. In this semester instruction should be given in problems of cabinet work.

2. Principles and processes to be taught. Steaming, bending, modeling and inlaying; the making and use of the dovetailed joint; stair building; furniture work; varnishing, piano finish.

3. Suggested exercises. Hand mirror; embroidery hoops; inlaid blotter pad; inlaid jewel box; tool chest; dovetailed joints. Such problems of larger cabinet work as stair building and the making of a piece of furniture.

CORRELATED AND SUPPLEMENTARY WORK.

1. The history, manufacture and use of glass, including cutting, grinding, polishing, moulding, blowing, etc.
2. Problems of constructive design.

Eleventh Grade. First Semester—

RECOMMENDED MINIMUM COURSE.

1. The work of this semester covers bench work in iron and steel.

2. Principles and processes to be taught. Chipping, filing, polishing, drilling, tapping, fitting, riveting, scraping.

3. Suggested exercises. The straight edge, chipping block, center punch, nail set; surface plate; calipers, surface gauge.

CORRELATED AND SUPPLEMENTARY WORK.

1. Metallurgy, iron and steel.
2. History and manufacture of supplies, such as files, carborundum, waste, oil drills, etc.

Eleventh Grade. Second Semester—

ART METAL WORK.

RECOMMENDED MINIMUM COURSE.

1. Principles and processes to be taught. Piercing, drilling, etching, beating, raising, hammering, soldering, chasing, enameling and coloring.

2. Suggested exercises. The making of hat pins, watch fobs, paper knives, card trays, bowls, book racks, spoons, ladles, etc.

CORRELATED AND SUPPLEMENTARY WORK.

1. Metallurgy of brass, copper and silver.
2. Study of silversmithing and jeweler's work, including designing and engraving.
3. Enamels and enamel work; firing, pottery and china painting.

Eleventh Grade. Second Semester—

RECOMMENDED MINIMUM COURSE.

NOTE.—This is an alternate course to be substituted for the one outlined above, if in the judgment of the instructor it is the most desirable.

1. Principles and processes to be taught. Soldering, bending, wiring, fluxes.

2. Suggested exercises. Manufacture of piping, tin cups, cookie cutter, elbow joint, etc.

CORRELATED AND SUPPLEMENTARY WORK.

1. Study of metallurgy of tin and zinc.
2. The advantages and disadvantages of tinsmithing as a trade.
3. Cornice work.
4. The installation of hot-air furnaces.
5. The development of surfaces as applied to the work.

DOMESTIC ECONOMY.

General Suggestions—

1. The course of study provides for four years' work in this subject, the work to be given three times each week, alternating with freehand drawing, given twice weekly. It will probably be found desirable to modify the course in drawing by offering simple freehand drawing during the first year only; throughout the second year, simple mechanical drawing, with emphasis on working plans, lettering, etc.; during the third year, the simpler forms of architectural drawing, emphasizing the principles of form, proportion and color as applied to plans and drawings both for the inside and outside of homes; during the fourth year, water color and decorative design, stenciling, etc. The aim of this part of the course should be to train young women in drawing and designing that may be turned to practical account in the making and beautifying of a home.

2. In the following arrangement, domestic science is made the major course during the first and third years, and domestic art the major course during the second and fourth years. This arrangement may be reversed, however, if circumstances make it desirable to do so. It may be found best to introduce the subject by offering the work in sewing, or domestic art, first. This branch requires the least equipment, which makes its introduction the least burdensome from a financial point of view.

3. The aim should be throughout the course to present all work from the most practical viewpoint possible, to make real potential housekeepers and homemakers of high school girls.

4. Emphasis should be laid on the necessity for economy, and the desirability of simple, good taste in all domestic concerns. To teach girls how to dress tastefully, how to live comfortably within ordinary means, and to be happy—these should be the great ends of this most vital branch of study.

5. A semester's work in industrial and economic history is most desirable for pupils in this course. While such a course is not provided for in the state board's outline, the semester's

work in Economics (see page 70) may well be modified to meet this demand.

6. Wherever practicable, this work should be accompanied by a course in human physiology, given with especial reference to the needs of young women. This should include the prevention, and simple home treatment of germ diseases; embryology; the nursing and care of infants; home sanitation. It is highly desirable that this course be given by a thoroughly capable instructor, preferably a woman.

7. Especial attention should be paid to the "home budget"—to planning the economical expenditure of the housekeeper's income. This is real "domestic economy."

DOMESTIC SCIENCE.

FIRST YEAR.

First Semester—

A. Food, Its Preparation.

I. Practical Work.

1. Carbohydrates; cooking of cereals, Italian pastes, white sauces, vegetables, cream soups, cornstarch puddings, and sugars.
2. Protein; cooking of eggs, milk in combination with eggs, cheese, meat, fish and gelatine.

II. Theoretical Work.

1. The equipment and care of the kitchen.
2. Classification of foods.
3. Special study of rice, macaroni, potatoes, other vegetables, sugar, eggs, cheese, meats and fish, and gelatine.
4. Experimental study of carbohydrates and protein.

Second Semester—

I. Practical Work.

1. Carbohydrates continued, flour mixtures.
2. Fats of milk, meat and vegetables.

(a) Desserts with cream.
(b) Salad dressings.
(c) Frying and sauteing of cooked and uncooked mixtures.

3. Mineral matter.

(a) Fruits and vegetables in sherbets and salads.

4. Beverages.
5. Preparation and serving of simple meals.

II. Theoretical Work.

1. Study of air, fuel and ranges.
2. Special study of materials used in flour mixtures, fats and oils and beverages.
3. Physics of freezing.

Note.—The above work is carried on by means of lectures, reference books, experiments, use of microscopes, and trips to markets and factories.

B. Physiology and Hygiene.

I. General Survey of Structure of the Body.

1. General structure.
2. Minute structure.
3. Chemical composition.

II. Processes of Life.

1. Oxidation.
2. Metabolism.

III. Nutrition of the Body.

1. Food—function, classification.

DOMESTIC ART.

SECOND YEAR.

First Semester—

I. Practical Work.

(a) Drafting—Snow system.

1. Sewing apron.
2. Corset-cover.
3. Drawers.
4. Petticoat.
5. Nightgown.

(b) Articles.

1. By hand—apron.
2. By hand and machine—under garments.

II. Theoretical Work.

(a) History, use and care of sewing machine.

(b) Cotton, its growth, cultivation, use; manufacture of cotton thread and fabric.

Second Semester—

I. Practical Work.

(a) Drafting—Snow system.

1. Kimona.
2. Shirt-waist suit.
3. Lining for waist.

(b) Articles.

1. Kimona.
2. Thin waist, using drafted pattern.
3. Waist lining—fitted and one side boned; either hooks or eyes sewed on boned side.
4. Shirt-waist suit of wool or cotton, depending upon season. Made by store pattern.
5. Mending; work in repairing garments.

II. Theoretical Work.

(a) Emery needles.

(b) Flax, its growth, cultivation, use, manufacture; study of linen fabric and thread.

(c) Discussion of color, form, lines, and texture applied to dress.

DOMESTIC SCIENCE.

THIRD YEAR.

First Semester—

General Subjects.

Food and its preparation.
Bacteriology.
Serving.
Economics.

A. Food and Its Preparation.

I. Canning, preserving and jelly-making.
II. Review and elaboration of first year's work.
III. Chafing dish cookery.
IV. Serving of simple meals at limited cost.

B. Bacteriology.

I. Yeasts.
II. Molds.
III. Bacteria.
IV. Milk supply.

C. Serving.

I. Care of dining room and table linen.
II. Serving, with and without a maid.

D. Economics.

I. Marketing.
II. Accounts.
1. Economic problems of the home.
2. Division of income.
3. Household accounts.

4. Saving time, strength and material in conducting household operations.
5. Relation of food to work.

Second Semester—

GENERAL SUBJECTS.

Food and its preparation.
Home nursing.
Sanitation.
Laundry.

A. FOOD AND ITS PREPARATION.

I. Fireless cookery.
Cooking of meats, vegetables and frozen mixtures.
II. Infant diet.
Cooking of modified milk, barley water, whey, etc.
III. Invalid diet.
Preparation and serving of meals to suit special conditions.
IV. Fancy cookery.
Bread, cakes, salads, entrees, meats, vegetables, desserts, sauces, and garnishings.
V. Preparation and serving of an elaborate dinner.

B. HOME NURSING.

I. Care of sick room.
II. Care of invalid.
III. Making of beds.
IV. Symptoms and treatment of common diseases.
V. Emergencies.

C. SANITATION. PUBLIC HYGIENE.

I. Public hygiene.
1. Water and milk supply.
2. Laws of Board of Health.
II. Personal hygiene.
1. Plumbing.
2. Ventilation and heating.

D. LAUNDRY WORK.

DOMESTIC ART.

FOURTH YEAR.

First Semester—

I. Practical Work.

(a) Wool suit, alternating with thin suit according to season.
(b) Altering of old material.
(c) Household linen.

II. Theoretical Work.

(a) Study of wool.
(b) Study of silk.

Second Semester—

I. Practical Work.

(a) Handmade waist or baby dress.
(b) Embroidery.
(c) Millinery.
(d) Household furnishings.

II. Theoretical Work.

(a) History and art of designing.
(b) History of costume.

Note.—All work in color design and ornamentation is correlated with the Art Department.

FREEHAND DRAWING.

General Suggestions—

The manual arts course provides that this subject may be given for girls one period per week during the first year, and two periods per week during the second, third and fourth years. In the same course, freehand and mechanical drawing are given three periods per week for boys throughout the first year.

The outline course does not specify whether the subject of freehand and mechanical drawing shall be carried parallel throughout the year, or, if the entire time is devoted to first one and then the other, which should come first. This matter is left to the judgment of the instructor. If the latter plan is followed, the freehand drawing should come first.

RECOMMENDED MINIMUM COURSE.

1. Instruction as to the selection, use and care of materials. Emphasize neatness, care and system. Call the attention of pupils to the simple principles of beauty. In this work a right idea at the beginning is of the highest value.

2. Drawing from natural objects—leaves, plants, or trees—in pencil, brush and ink, and water colors. Devote most of the attention to the execution of detail. The object of this part of the course is to familiarize pupils with making marks that mean something.

3. Geometrical figures and still-life studies. Develop the principles of perspective, light and shade, elevation. Begin with familiar objects or make out-of-door sketches of buildings, showing how to bring unrelated spots into relationship through the principles of design. Study illustrations of representative examples of architecture, sculpture and painting, such as may be found in many text-books.

4. Animal studies. Study the forms of animals from life and illustration. Sketch figure poses showing different positions or actions. Call attention of pupils to the anatomical studies of some of the great masters—Rembrandt, Bonheur, etc. Some prints of famous pictures by Bonheur and Landseer should be hung where they may be seen by the class. These should be studied as examples, not copied. Copying pictures of animals is not making animal studies.

5. Studies of human life. Begin with simple plaster casts. Then take up drawing from life poses; figure sketching from the draped model in pencil, ink or wash; illustration, using the figure pose in simple studies.

SUPPLEMENTARY WORK

1. Figure sketching, illustration and caricature work. This field is so large, and work in it so dependent on the talent of the individual pupil, that it can only be suggested.

2. Treatment of home interiors. This work is especially adapted to girls doing advanced work in household economy. The subject furnishes a variety of problems, first in schemes of spacing and color for inclosed surfaces; second, for furniture; third, for hangings and small useful articles.

REFERENCE BOOKS.

In any high school in which a complete course in drawing is offered, there should be a few books, wisely selected, on art and allied subjects. A high school graduate cannot take with him a more valuable feature of his mental equipment than a well-developed, tasteful sense of the artistic. This should be practical, free from all affectation, and such as to contribute to his personal happiness and efficiency.

The following list is by no means exhaustive, yet from it may be selected a very practical working library for any high school:

Adeline. Art Dictionary. Appleton.
Batchelder. Principles of Design. Inland Printer Co., Chicago.
Blunck. Lessons on Form. Hessling.
Brown, F. C. Letters and Lettering. Bates and Guild.
Clark, E. E. Plant Form. Lane.
Cockerell, D. Bookbinding. Appleton.
Crane, Walter. Basis of Design. Macmillan.
Crane, Walter. Decorative Illustration. Macmillan.
Crane, Walter. Line and Form. Macmillan.
Cross, A. K. Freehand Drawing. Ginn.
Cross, A. K. Light and Shade. Ginn.
Day, Lewis F. Art in Needle Work. Scribners.
Day, Lewis F. Anatomy of Pattern. Scribners.
Day, Lewis F. Nature in Ornament. Scribners.
Day, Lewis F. Pattern Design. Scribners.
Day, Lewis F. Alphabets, Old and New. Scribners.
Dow. The Teaching of Art. Teachers' College, N. Y.
Duc, Viollet C. Learning to Draw. Putnam.
Fletcher. History of Architecture. Scribners.
Glazier. Manual of Historic Ornament. Scribners.
Hamerton. Graphic Arts. Little, Brown & Co.
Hamlin. History of Architecture. Longmans.
Hammock. Manual of Arts. Heath.
Haney. Art Education in the Public Schools of the United States. Am. Art Annual, 546 5th Ave., N. Y.
Hatton. Figure Drawing and Composition. 2 vols. Scribners.
Hatton. Elementary Design. Scribners.
Hoyt. World's Painters. Ginn.
Jack, George. Wood Carving. Appleton.
Jackson. Lessons in Decorative Design. Scribners.
Jackson. A. B. C. of Drawing and Design. Scribners.
Johnston. Manuscript and Inscription Letters. John Hogg, London.
Johnston. Writing and Illuminating. John Hogg, London.
Maginnis. Pen Drawing. Bates and Guild.
Marquand and Trothingham. History of Sculpture. Longmans.
Matthewson. Perspectives from Working Drawing. Taylor Holden Company, Springfield, Mass.
Meyer. Handbook of Ornament. Hessling.

Midgley and Lilly. Plant Form and Design. Scribners.
Miller, L. W. Essentials of Perspective. Scribners.
Norton, Dora M. Freehand Perspective. Published by the author, Pratt Institute, Brooklyn, N. Y.
Nye, Alvin. Furniture Designing. Comstock.
Owen and Bunce. Nature's Aid to Design. John Lane.
Reinach, S. Story of Art Through the Ages. Scribners.
Riverside Art Series. (Collection of paintings). Houghton.
Rose, A. F. Copper Work. Davis Press, Worcester, Mass.
Ross, Denman. Theory of Pure Design. Houghton.
Seegmiller. Applied Arts. Atkinson, Mentzer & Grover.
Spooner. Cabinet Making (design). Appleton.
Tarbell. History of Greek Art. Macmillan.
Van Dyke. History of Painting. Longmans.
Ward. Historic Ornament. 2 vols. Scribner.
Whitcomb. Young People's Story of Art. Dodd.
Periodical publications—
The Craftsman. Stickley. $3.00 per year.
The School Arts Book. Davis Press. $1.50 per year.
The International Studies. John Lane. $5.00 per year.
Palette and Brush. Lewis Publishing Co. $4.00 per year.
The Painting Art. University Press. $1.00 per year.

MECHANICAL DRAWING.

The outline course of study of the state board provides that drawing work shall be offered throughout the entire manual arts course. As this subject is in a state of development, it is not an easy matter to outline a course that will be equally adaptable to all high schools in the state in which it may be offered. The instructor will do well to note the suggestions offered in regard to drawing under the head of Manual Training. The following is the work outlined in the course of study for the Tacoma high school and is offered here rather as a suggestion as to what may well be covered, than a required amount of work. Supplementary work, and indeed the contents of the minimum course itself, may be largely devised or modified by the instructor. A good text in mechanical drawing should be used and followed carefully.

Two periods per week, each period being double the length of a regular recitation period, should be devoted to this work throughout the entire course.

Ninth Grade. First Semester—

RECOMMENDED MINIMUM COURSE.

Six plates are required covering use of instruments, simple geometrical problems, practice in lettering and working drawing of shop models.

Ninth Grade. Second Semester—

RECOMMENDED MINIMUM COURSE.

This work requires six plates and aims to parallel the shop work of the same grade. Designing, tracing and blue printing of the shop models are followed by detail and assembly drawings.

Tenth Grade. First Semester—

RECOMMENDED MINIMUM COURSE.

Six plates are required.

Projections—problems in orthographic, isometric and cabinet projection. Views in the third angle, revolution on axes, planes and sections.

Tenth Grade. Second Semester—

RECOMMENDED MINIMUM COURSE.

Six plates required.

Sections, intersections, development of surfaces and simple sheet-metal pattern-making. Working drawings of cabinet models.

Eleventh Grade. First Semester—

RECOMMENDED MINIMUM COURSE.

Problems in line shading, material of construction and screw threads.

Eleventh Grade. Second Semester—

RECOMMENDED MINIMUM COURSE.

Problems in gear teeth and machine drawing.

REVIEW OF COMMON BRANCHES.

The outline course of study provides that a review of the common branches in the public schools may be offered as an optional course in the twelfth grade. No attempt will be made here to outline in detail the work in the several branches, which should be covered in such a course. This course will probably be taken by young people who look forward to teaching school, and if well taught should be a valuable adjunct to their high school training. The following suggestions may be pertinent:

1. The easier aspects of the branches should be left out. The instructor should guard against letting this work retrograde into a "snap" course. Common English grammar, arithmetic, geography, and other subjects of the grades may be studied from just as scientific and philosophical a point of view as the most advanced of the so-called higher branches.

2. The aim should be to give the pupil a broader and deeper view of subjects that have been to some degree familiar to him from childhood up. He should be given occasion to draw on all the knowledge he has obtained in his high school course. In this way the work may be made not only a review of the common branches, but a very profitable review of the high school studies, pointing out to the pupil the relation of his fund of learning to his daily life.

3. If the class is composed mainly of young people who expect to teach, the simpler pedagogy of the various branches should be drawn on freely.

ENTRANCE REQUIREMENTS OF STATE INSTITUTIONS OF HIGHER LEARNING.

I. REQUIREMENTS FOR ADMISSION TO THE FRESHMAN CLASS OF THE UNIVERSITY OF WASHINGTON.

The following fixed requirements have been made for the years 1911-12 to 1915-16, inclusive:

To be admitted to the freshman class students must either (a) pass an examination based on a course amounting in the aggregate to fifteen units, or (b) complete a course of the same length in an accredited school. Of these fifteen units eight and one-half are specified and required of each student; the remaining six and one-half are elective from the list of optional subjects:

Specific Subjects.	Optional Subjects.
Algebra, 1½ units.	Agriculture, 1 or ½ unit.
***English, 4 units.	Astronomy, ½ unit.
A History, 1 unit, (American History preferred) or	**Bookkeeping, ½ unit.
U. S. History and Civics, 1 unit.	Botany, ½ or 1 unit.
Physics, 1 unit.	Chemistry, 1 unit.
Plane Geometry, 1 unit.	Civics, ½ unit.
Total, 8½ units.	**Commercial Arithmetic, ½ unit.
	**Commercial Law, ½ unit.
	Drawing, ½ or 1 unit.
	Economics, ½ unit.
	**Economic Geography, ½ unit.
	French, 1, 2 or 3 units.
	*Geology, ½ or 1 unit.
	German, 1, 2, 3 or 4 units.
	Greek, 1, 2, 3 or 4 units.
	History, 1, 2, or 3 units.
	Latin, 2, 3 or 4 units.
	*Physical Geography, ½ or 1 unit.
	*Physiology, ½ or 1 unit.
	Solid Geometry, ½ unit.
	Spanish, 1 or 2 units.
	Trigonometry, ½ unit.
	Zoology, ½ or 1 unit.
	**Shopwork and Mechanical Drawing, not more than 2½ units.
	**Domestic Science and Drawing, not more than 2½ units.

* 1 unit accepted only after approval of a definite laboratory course.

**The aggregate amount presented in the following subjects, viz.: Bookkeeping, Commercial Arithmetic, Commercial Law, Economic Geography, Manual Arts, and Domestic Science, may not exceed 3 units.

*** A student presenting one or more units of a foreign language, in excess of the requirements in foreign language, may be admitted with

three units of English. In addition, any modern foreign language will be accepted for entrance credit which the candidate can read, write and speak, and the grammar and literature of which he has studied as a part of his secondary training. In such cases the candidate will be held to the full requirements in English.

NOTE 1. To count as a "unit" a subject must be taught five times a week, in periods of not less than forty-five minutes, for a school year of not less than thirty-six weeks.

NOTE 2. Among the six and one-half elective units there must be included certain subjects determined by each particular college or school of the university as follows:

I. COLLEGE OF LIBERAL ARTS.

Classical Group. Four units of foreign language, not less than two being Latin.

NOTE. While the language requirements for this group are specified in this way as a concession to the smaller high schools, students should by all means present, as the best preparation for entrance to the classical group, four years of Latin and three years of Greek, whenever it is possible.

Modern Language-Literature Group. Four units of foreign language.

Philosophical Group. Same requirements as for any of the other groups.

Science Group. Two units of a foreign language, one unit of chemistry or biology, one-half unit of solid geometry.

II. COLLEGE OF ENGINEERING AND SCHOOL OF MINES.

Two units of a foreign language, one unit of chemistry and one-half unit of solid geometry.

NOTE. For the present, graduates from schools unable to offer chemistry, may present a unit of biology.

III. SCHOOL OF PHARMACY.

The requirements may be satisfied by entrance similar to that of any other college or school of the university.

IV. SCHOOL OF LAW.

The requirements may be satisfied by entrance similar to that of any of the other colleges or schools, and the completion of one year's work in the College of Liberal Arts.

II. REQUIREMENTS FOR ADMISSION TO THE FRESHMAN CLASS OF THE STATE COLLEGE OF WASHINGTON.

ADMISSION.

Applicants for admission to the State College must be at least sixteen years of age, must present evidence of good moral character and must offer at least thirty credits* of high school work, so chosen as to include those prescribed for the particular department he wishes to enter.

Two methods are provided for the obtaining of freshman standing in the college.

I. Entrance by examination.

II. Entrance by certificate.

Of the thirty credits required for entrance, the following are prescribed for admission to all departments:

English	6 credits
Algebra	3 "
Geometry	2 "
Physics	2 "
American History and Civics	2 "
Total	15 credits

In addition to the above required credits, the following departmental prerequisites must be fulfilled:

DEPARTMENTAL PREREQUISITES.

For entrance to the department of—

Agriculture, Horticulture and Geology.
- Biological Science ..... 2 credits

Botany and Zoology.
- Latin ..... 2 credits
- Biological Science ..... 2 "

(One of these credits should correspond to the department the candidate wishes to enter.)

English and Modern Language.
- Latin ..... 4 credits

Electrical, Civil, Mechanical and Mining Engineering.
- Solid Geometry ..... 1 credit

Latin.
- Latin ..... 8 credits

Veterinary Science.
- Latin ..... 2 credits

* A credit is the equivalent of five 45-minute recitations per week for not less than 18 weeks. A unit is equal to two credits.

LIST OF OPTIONAL STUDIES.

The optional credits must be chosen from the following list, not more than eight credits to be selected from any one group:

GROUP A. ANCIENT LANGUAGES.

Greek.
Latin.

GROUP B. MODERN LANGUAGES.

German.
French.
Spanish.

Not less than two credits accepted in any subject in either of these groups:

GROUP C. HISTORY AND ENGLISH.

American History and Civics.
British History.
Medieval and Modern History.
Ancient History.
Economics.
English.

GROUP D. SCIENCE.

Physics.
Chemistry.
Biological Science.
Physiography, 1 credit.
Physiology, 1 credit.
Solid Geometry.
Higher Arithmetic, 1 credit.
Commercial Arithmetic, 1 credit.
Trigonometry.

GROUP E. INDUSTRIAL.

Agriculture (including Horticulture).
Domestic Economy.
Mechanic Arts.
Freehand Drawing, 2 credits.
Bookkeeping, 2 credits.
Stenography or stenography and typewriting, 2 credits.
Commercial Law, 1 credit.
Commercial Geography, 1 credit.
Music (by examination only), 2 credits.

I. Entrance by Examination.

When candidates are unable to present satisfactory evidence of completion of the required preparatory work they will be required to

pass a satisfactory matriculation examination in the subjects listed for entrance to the various departments.

(NOTE.—Prospective applicants for admission by examination should write to the Registrar of the College for information concerning the dates of these examinations. They usually occur about the third week in September.)

II. Entrance by Certificate.

The following certificates of entrance credit will be accepted in lieu of matriculation examinations, in so far as they cover the entrance requirements already outlined.

(a) Certificates showing graduation from public high schools and other educational institutions of this state whose courses of study have been approved by the faculty of the State College and accredited by the State Board of Education.

(b) Certificates from four-year high schools in other states, whose diplomas admit to the university of the said state.

(c) Certificates from the elementary departments of the state normal schools.

(d) State teachers' certificates.

FORM OF ENTRANCE CERTIFICATES.

The State College furnishes blank forms for entrance certificates. These may be obtained from the Registrar. These certificates must be signed by the superintendent or principal of the school and sent direct to the Registrar of the College at least three weeks prior to the opening of college.

Until such certificate is received, no matriculation credit can be placed upon the college records.

CONDITIONAL ADMISSION.

A candidate presenting less than the required number of credits for entrance will be admitted to the freshman class conditionally, provided his deficiency does not exceed four credits. This deficiency must be made up before the beginning of the sophomore year.

III. TERMS OF ADMISSION TO STATE NORMAL SCHOOLS.

The general terms of admission to the State Normal Schools of Washington are as follows:

Age. Girls, fifteen years; boys, sixteen years.

Character. Evidence of good moral character and good health are required.

Completion of Local High School. After September 1, 1910, no State Normal School of Washington shall admit any student from a district maintaining a high school who has not completed the high school course of his home district, unless:

1. He has a teacher's certificate; or

2. Is more than 19 years old; or

3. Has been promoted from the Training Department of a State Normal School; or

4. Brings a written request from the principal of the high school of his home district, with satisfactory reason that he should be admitted to a normal school.

Advanced Standing. Students who have completed work in other institutions will be granted such advanced standing in the institution where application is made for admission, as their credentials may justify.

Following is given the terms of admission to the several courses of study offered by the State Normal Schools of Washington:

Terms of Admission to the Complete Course.

Two years of high school work, provided that students who desire to enter upon this course with one year of high school preparation may take up the first year of this course in the tenth grade of the training department.

Terms of Admission to the Elementary Course.

1. Completion of tenth grade work in an accredited high school; or

2. One year of accredited high school work and the holding of a second grade teacher's certificate; or

3. Special training and practical business experience deemed by the normal school authorities to be equivalent to two years of training above the common schools, provided that such applicants shall be not less than twenty years of age; and provided further, that prior to receiving an elementary certificate all applicants shall have completed the four years of work above the eighth grade required for the completion of the elementary course.

Terms of Admission to the Secondary Course.

Three years of high school work, based upon the following requirements:

English, 3 years.
Mathematics, 2½ years.
Science, 1 year.
History, 1 year.
Electives, 4 years.

NOTE. One year of work implies four or five recitations per week for one school year of thirty-six weeks.

Terms of Admission to Advanced Course for Graduates of Accredited Schools.

A diploma from an accredited school or its equivalent.

NOTE. (a) Each candidate for a secondary normal school certificate or a diploma must earn, before graduation, one credit in sex and moral hygiene and one credit in scientific temperance and humane education. (b) At least one year of residence is required of all students who receive a secondary normal school certificate or a diploma, and three-quarters of work in residence are required of all who receive elementary normal school certificates.

OUTLINE COURSE OF STUDY FOR FOUR-YEAR ACCREDITED HIGH SCHOOLS OF THE STATE OF WASHINGTON.

[Adopted February 21, 1910.]

Year	Classical Course	Scientific Course	English Course	Commercial Course	Manual Arts Course	Options
1st Year	English (5) Algebra (5) Latin (5) Option (5)	English (5) Algebra (5) Phys. Geog. (5) Option (5)	English (5) Algebra (5) Phys. Geog. (5) Option (5)	English (5) Algebra (5) Com. Geog. or Penmanship—1st semester (5) Com. Arithmetic—2nd semester (5) Option in Science	English (5) Algebra (5) *Boys*—Freehand and Mechanical Drawing (3), and Bench Work (2) *Girls*—Freehand Drawing (1), and Domestic Science, or Domestic art (4) Option (5)	Ancient History (5) Modern Language (5) Agriculture (5)
2nd Year	English (5) Geometry (5) Latin (5) Option (5)	English (5) Geometry (5) Botany or Zoology (5) Option (5)	English (5) Geometry (5) Botany or Zoology (5) Option (5)	English (5) Geometry (5) Bookkeeping (10) Option (5)	English (5) Geometry (5) *Boys*—Mechanical Drawing (2), Cabinet Work or Lathe (3) *Girls*—Freehand Drawing (2), and Domestic Art or Domestic Science (3) Option (5)	Med. and Mod. History (5) Modern Language (5) Agriculture (5)
3rd Year	English (5) Algebra—1st semester (5) Solid Geometry. or Option—2nd semester (5) Latin or Modern Language (5) Option (5)	English (5) Algebra—1st semester (5) Solid Geometry.—2nd semester (5) Foreign Language (5) Option (5)	English (5) Algebra—1st semester (5) Solid Geometry. or Option—2d semester (5) English History Option (5)	English (5) Advanced Bookkeeping (10), or an Option (5) Stenography and Typewriting (10) Option (5)	English (5) *Boys*—Mechanical Drawing (2), and Iron Working or Advanced Woodworking (3), Algebra and Solid Geometry (5) *Girls*—Freehand Drawing (2), and Advanced Domestic Science or Art (3) Option (5) Option (5)	English History (5) Chemistry (7) Geology (½) (5) Horticulture or Agriculture (5) Higher Arithmetic (½) (5) Economics (½) (5) Greek (5)
4th Year	English (5) Am. History and Civics (5) Physics (7) Latin or Modern Language (5)	English (5) Am. History and Civics (5) Physics (7) Foreign Language (5)	English (5) Am. History and Civics (5) Physics (7) Option (5)	English (5) Stenography and Typewriting (10) Economics—1st semester (5), and Com. Law—2d semester (5) Am. History and Civics, or Option (5)	English (5) Am. History and Civics (5) *Boys*—Mechanical Drawing (2), and Machine Shop or Advanced Woodworking (3), or Option (5) *Girls*—Freehand Drawing (2), and Advanced Domestic Science or Arts (3), or Option (5) Physics (7)	Astronomy (½) (5) Geology (½) (5) Trigonometry (½) (5) Psychology (½) (5) Higher Arithmetic (½) (5) Public Speaking (5) Review of Common Branches (5) Horticulture or Agriculture (5) Greek (5)

NOTES: A semester each of physical geography and physiology may be substituted for a year of the former.
A semester each of botany and zoology may be substituted for a year of either.
Physics may be given in the third year by schools that prefer to give chemistry in the fourth year.
Girls in the manual arts course are advised to elect chemistry.
Fourth year students in the classical course, who desire both Latin and a modern language to meet college entrance requirements, may omit American history and civics, provided that a year of history has been elected earlier in the course.
The regular recitation period shall be doubled for manual arts and drawing.
Options for any year may be filled by the selection of subjects prescribed in any course for that or any previous year.

OUTLINE COURSE OF STUDY FOR FOUR-YEAR NON-ACCREDITED HIGH SCHOOLS AND FOR HIGH SCHOOLS MAINTAINING LESS THAN FOUR YEARS' WORK.

[Adopted February 21, 1910.]

YEAR	REQUIRED	OPTIONS
1st Year	English (5) Algebra (5) Physiography (5), or Agriculture (5) Option (5)	Ancient History (5), or Manual Arts (5), or Com. Arithmetic (½) and Com. Geography (½) (5), or Foreign Language (5)
2nd Year	English (5) Plane Geometry (5) Botany (5), or Zoology (5) Option (5)	Med. and Mod. History (5), or Manual Arts (5), or Bookkeeping (10), or Foreign Language (5)
3rd Year	English History (5) Adv. Algebra—First semester (5) English (5) Solid Geometry or Higher Arithmetic—Second semester (5) Option (5)	Manual Arts (5), or Foreign Language (5), or Horticulture (5)
4th Year	English (5) Am. History and Civics (5) Physics (7) Option (5)	Manual Arts (5) Foreign Language (5) Review of Common Branches (5)

NOTE: A foreign language begun during the first or second year should be continued for two years.

RULES GOVERNING THE ACCREDITING OF HIGH SCHOOLS AND HIGH SCHOOL COURSES IN WASHINGTON.

ADOPTED DECEMBER 30, 1910.

1. How Accredited.

High schools may be placed by the State Board of Education on a list of four-year accredited high schools, or upon a list of one-, two-, or three-year accredited high schools, all or certain specified ones of whose courses are approved and accredited only after personal inspection by authorized representatives of the state board. When first placed upon the list of accredited schools, any high school shall be accredited for one year only, or until such time as the board may provide for another inspection.

2. Definition of an Accredited School.

Accredited high schools are those four-year secondary schools in which the courses of study, teaching corps and facilities for instruction have been found by inspection to be up to the standards fixed by the State Board of Education. The graduates of such high schools are accredited for admission to such prescribed courses in the University of Washington, the State College of Washington and the advanced courses of the State Normal Schools of Washington as their preparation warrants, in accordance with and subject to the limitations prescribed by law; provided, that any high school graduate applying for admission to institutions of higher learning in Washington shall present a certified copy of his high school record.

3. Purpose of Accrediting.

The accrediting of specific courses of undergraduate work in the four-year high schools and in the one-, two-, and three-year high schools is intended to standardize and establish a basis, and form a guide for the admission of students passing from one high school to another and for entrance to the elementary and secondary courses of the State Normal Schools.

4. Method of Inspection.

For the present, the Board of Education shall be represented for the accrediting of four-year high schools by the

State Superintendent of Public Instruction or a person designated by him, or by persons appointed for that purpose by the University of Washington or the State College of Washington. The inspection of one-, two-, and three-year high schools shall be made either by the State Superintendent or a person designated by him, or by persons chosen from the faculties of the State Normal Schools.

5. Powers and Duties of Inspectors.

The function of the inspector shall be to examine the high school carefully as to all details of the work, equipment and *esprit du corps* of the high school, and on the basis of this examination, report his findings and recommendation to the State Board of Education, by whom, as provided by law, the accrediting shall be done.

6. Rules and Standards Governing the Accrediting of Four-Year Schools.

The following shall constitute the standards with reference to four-year accredited high schools:

I. No high school shall be so accredited which does not require at least sixteen units for graduation, fifteen of which shall be taken from the course of study outlined by the State Board of Education. A unit is the completion of a subject of five recitations or their equivalent laboratory periods per week, pursued throughout a school year of not less than thirty-six weeks.

II. All recitation periods, for classes of ten or more pupils, shall be at least forty-five minutes in length; for classes of not less than six nor more than ten pupils, at least forty minutes in length; for classes of less than six pupils, at least thirty-five minutes in length. Two periods of laboratory work shall be considered of equal instructional value with one period of recitation.

III. No school shall be accredited which does not have three or more teachers giving their entire time to the work of instruction. The scholastic preparation of any high school teacher shall be such as especially to qualify him to give instruction in the subjects which he teaches. The minimum scholastic at-

tainment, except for teachers of special subjects, should be graduation from a standard college, except in the case of instructors who, by reason of native ability, experience, and scholastic training are considered by the inspector as having qualifications equivalent to such graduation. In no case shall the state board accept the work of an instructor who shall have scholastic training less than graduation from the advanced course of the State Normal Schools of Washington or its equivalent; provided, that this rule shall not disqualify any teacher employed in high school work in this state prior to January 1, 1911.

IV. The laboratory and library facilities shall be adequate for the proper giving of the courses of instruction offered in the curriculum, as provided on pages 76, 86, and 118 of the State High School Manual. The inspector shall note the floor space provided for laboratory work as compared with the average number of students taught, the lighting and ventilation of the laboratory, the desks, apparatus, maps, illustrative material and supplies provided for such instruction. He shall also take note of the condition of grounds and toilet facilities. The library shall contain a sufficient number of reference and other books, as indicated in the High School Manual, for supplementing the instruction in the several courses offered, and for the general literary culture of the school as a whole.

7. Changes in the Corps of Teachers.

In the event of a change in the principalship or a majority of the teaching corps of any accredited high school, such high school shall be deemed accredited only until such time as another inspection can be made and the report acted upon by the State Board of Education.

8. Additional Duties of Inspectors.

It shall be the duty of high school inspectors, especially when inspecting small high schools, to examine as far as pos-

sible and report to the state board concerning the following matters:

I. The equipment, teaching force, quality of school work and sanitary conditions prevailing in grades below the high school.

II. The effort made by the local school board and the superintendent or principal to keep up high standards of work in the grammar grades, in proportion to the efforts made to maintain a high school. If, in the judgment of the inspector, disproportionate emphasis is laid on the high school, to the neglect of the grammar grades, he shall report the fact, together with any recommendations for changes that he may have to make.

III. The general attitude of the community toward the maintenance of a high school.

IV. The number of high school pupils reported by the principal as enrolled, as compared with the average number in actual daily attendance.

V. The number of pupils enrolled at the beginning of the year who have dropped out, and the reasons for their discontinuance. To this end the inspector shall examine the attendance records.

9. General Conditions of Eligibility of High Schools.

The efficiency of instruction, the acquired habits of thought and study, the general intellectual and moral tone of the school are paramount factors, and therefore only schools which rank well in these particulars as evidenced by rigid, sympathetic, thorough-going inspection shall be considered eligible for the accredited list.

10. Requirements as to Facilities for Small High Schools.

In one-, two-, and three-year high schools, the facilities for instruction shall be the same as, or fully equivalent to, those required for four-year high schools with respect to subjects taught. The object of this rule is to make the standards of work in schools offering less than four years of instruction as high as in those that offer four full years of high school work,

and to so standardize the work of small high schools throughout the state that course for course, accredited work in one will be the equivalent of accredited work in any other. The requirements regarding teaching force and equipment in one-, two-, and three-year high schools shall be as follows:

I. No three-year high school shall be accredited unless two teachers give their full time to the work of instruction.

II. No two-year high school shall be accredited unless one teacher gives his whole time to the work of instruction.

III. No one-year high school shall be accredited unless one teacher gives one-half of his time to the work of instruction.

IV. No school shall be accredited unless the district is spending or agrees to spend in the future, on its school library, at least $15.00 per year for each grade maintained.

V. No school shall be accredited in which the equipment is manifestly lacking; said equipment to include rooms, seats, desks, apparatus, maps and illustrative material.

11. Minimum Attendance.

The grades accredited in any high school shall maintain in the aggregate an average daily attendance of six pupils to the grade. (Rule adopted May 30, 1910.)

12. Course of Study.

All high schools shall follow the course of study outlined by the State Board of Education in February, 1910. The course of study offered in any high school must be approved by the State Superintendent of Public Instruction and there shall be annually forwarded to him by the principals of the high schools on or before October 1st of each year on blanks to be furnished by him, a report giving the course of study in full, and the names and qualifications of the members of the high school faculty.